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OCEANOGRAPHIC DATA REPORT
AMUNDSEN GULF
August - September 1977

R. W. Macdonald, M. E. McFarland,
S. J. De Mora, D. M. Macdonald and W. K. Johnson

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ABSTRACT

Ocean Chemistry carried out sampling and analysis during the Pandora II hydrographic cruise to the western arctic in the summer of 1977 on an opportunity basis. Data were obtained at a total of 18 stations for salinity, temperature, oxygen concentration, particle size distribution (Coulter counter), nutrients (reactive silicate, phosphate and nitrate) and are tabulated here. Additional seawater sampling for hydrocarbons and mercury, net hauls (Miller and Neuston) and sediment sampling are also compiled but analytical results are not included.

ACKNOWLEDGEMENTS

We would like to express our gratitude to A. D. O'Connor, J. A. Vosburgh and A. R. Raymond for assistance with the sampling, and for providing station locations and cruise track records. S. Blasco and C. Malkins helped immensely during the cruise by handling the coring and grab sampling. The manuscript was prepared by B. Mathias and C. Jones. Last but not least we thank Chart Production for providing high quality photographs of all of our drawings in a very efficient manner.

INTRODUCTION

During the summer of 1977, M. V. Pandora II was sent to the western arctic with the primary purpose of carrying ot a hydrographic and magnetic survey in Amundsen Gulf (O'Connor, 1977). In order to take advantage of the presence of a hydrographic vessel in this region, both Energy Mines and Resources (E.M.R.) and Ocean Chemistry of Ocean and Aquatic Sciences (O.A.S.) were each allowed a complement of two scientists, and would gather data on an opportunity basis.

As a result of a high degree of cooperation and efficiency, much data were collected both by Ocean Chemistry and E.M.R. This report summarizes the chemical data and includes the results for such analyses as salinity, temperature, oxygen, reactive silicate, phosphate and nitrate, and particulate concentration (Coulter counter). The collection of samples for other more specialized chemical analysis is summarized but analytical results are not included. This report is intended to make available all of the support chemical data.

SAMPLING

(a) Net Hauls

At opportunity, and weather permitting, a slow hydrographic line was run. During this slow run (5 knots) Neuston net and Miller net hauls were carried out simultaneously at several time intervals depending on the time required to complete the line. At the same time continuous seismic profiling was carried out with an air gun. Lines were run in a generally north-south or south-north direction following the Decca Green hyperbolic lanes (See Figure 1). The Miller nets were deployed first and recovered last with the Neuston net being set and retrieved during the Miller net haul. Initially the Neuston net was deployed from the starboard boom but the angle of towing resulted in fraying of the wire, and pieces of grease falling into the ocean ahead of the net. This situation became intolerable, and during tow #3 the net was almost lost. After this, the net was fastened with 1" polypropylene rope at the bow, and the inboard towing wires on the net frame were shortened to cause the net to tow away from the ship's side. This much improved the performance of the net (see O'Connor, 1977 for a photograph of the net in tow).

Because the ship's speed was 5-6 knots the Miller nets did not perform well, and it was found that only two nets could be used. Generally tows were run at about 40-50 meters. Very little material could be obtained at depths shallower than this. Mesh size #6 was used on virtually all of the tows (243 μ aperture). In the few tows attempted with mesh #20 (75 μ aperture) the net was too fine and tended to clog resulting in poor flow through. Material was subsampled from the stainless steel cod end without washing down the side of the net. This was done to avoid possible contamination of metals or hydrocarbons from the hose, or the ship's water system. Nets

were washed out after sampling. When there was sufficient sample it was split in a Folsom splitter, 1/8th being preserved in 5% buffered formaldehyde, and the remainder being stored in a Whirl Pak bag and frozen (metal analysis) or in an aluminum can and frozen (hydrocarbon analysis). Splitting was carried out in a plastic (HNO_3 rinsed) splitter for trace metals, and an aluminum (solvent rinsed) splitter for hydrocarbons. Material saved for biological identification was dyed with a small amount of Bengal red (Miller tows) or ethylene blue (Neuston tows).

(b) Water Samples

A National Bureau of Standards (N.B.S.) sampler was used to collect surface water for hydrocarbon analysis. Samples were obtained first at each station from as far forward as possible on the starboard side (1 gallon). Samples were immediately poisoned with $HgCl_2$ (60 mg) and stored in the cooler ($4^{o}C$).

Hydrocasts were carried out with 1.7 L Niskin P.V.C. bottles at standard depths. (H.O. publication #607, 1968.) Samples were drawn for oxygen analysis, particulate material, salinity and nutrients. Each bottle was equipped with two reversing protected thermometers, and all bottles at depths of 200 m or greater had one unprotected thermometer.

The particulate analysis was performed immediately on a TA II Coulter counter with a 200 μ aperture. Samples for particulate matter obtained at stations 30, 31 and 32 were stored too long before analysis and have been deleted. Nutrient samples were stored frozen unfiltered, and were usually solid within 20 minutes of being placed in the freezer. Nutrients were sampled into 20 mL tubes, two glass tubes for phosphate and two plastic tubes for nitrate and silicate. Analysis for reactive silicate, nitrate and phosphate was carried out on a Technicon II auto-analyser using the methods outlined in the Reference Manual for Ocean Chemistry sampling techniques (1976). Some difficulties were encountered in analysis of the silicate samples with some samples being lost due to incorrect reagent preparation, and others with salinities less than 27 $^{o}/oo$ not being thawed for a long enough interval (Burton et al 1970). These samples have been deleted from the data tables. Oxygen analysis was carried out within a day by the Micro-Winkler technique (Carpenter, 1965). All salinities were analyzed on board with an Autolab inductive salinometer with duplicate determinations being within $\pm$ 0.003 $^{o}/oo$. Concurrent with the hydrocast, several acid-cleaned 5 L Niskin samplers (equipped with Teflon coated stainless steel springs) were placed on the wire, and samples were obtained from these for mercury in seawater analysis. These were preserved with 50 mL of concentrated HNO_3 and 2 mL of a 5% $K_2Cr_2O_7$ solution and stored in a cooler at $4^{o}C$ until analysis. Most of the seawater mercury analyses were run on board toward the end of the cruise. Bottles used for storing the water for mercury analysis were specially cleaned before the cruise and stored with a 5% HNO_3, 0.01% $K_2Cr_2O_7$ solution in them (Feldman, 1974).

Deep casts were made separately for water for hydrocarbon analysis by using the Clark-Blumer sampler (Clark et al, 1967) equipped with a rupture disc. Silk gloves were used while handling the 5 L glass inserts and during rupture disc installation. Samples were immediately poisoned with $HgCl_2$

(60 mg) and stored in the cooler at 4°C. Due to a rupture in the hydraulics of one of the winches early in the cruise, hydrocarbon sampling was suspended until the decks became sufficiently clean so that gross contamination of the sampling equipment would not take place.

(c) Sediment Sampling

Surface sediment was obtained where possible with a Shipek model 860 bottom grab sampler. Each grab sample was examined for stratigraphy, colour, odour and reaction with HCl. A subsample was obtained, placed in an aluminum can and immediately frozen for hydrocarbon analysis.

A core was obtained where possible with a Benthos Model 2171, 118 Kg gravity corer. At the first station (17) the core was extruded and subsampled into Whirl Pak bags which were then frozen. Time considerations, and the rolling of the ship, resulted in all of the remaining cores being frozen in the polycarbonate tube (6.8 cm i.d.) and stored frozen. Initially the corer was used without the barrel with just the polycarbonate tubing and a stainless steel cutter and retainer held at the end with hose clamps. This resulted in low resistance, facilitating deep penetration of the sediment with minimal disturbance. Loss of the cutter and head at station 21 forced the use of the steel barrel with a polycarbonate tube as an insert. The cutting head was brass, and a core retainer was fabricated from brass sheeting and silver solder.

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FIGURE 1. Station Locations and Net Haul Tracks

TABLES

TABLE 1

AMUNDSEN GULF STATION LOCATION

Station	Date	Time;GMT	Location N	Location W	Sonic Depth (m)	Comments*
14	11.8.77	1430	71°14.12'	124°32.48'	330	NBS
		1458	71°13.67'	124°32.97'	318	BC
		1537	71°13.07'	124°33.27'	267	SG
15	11.8.77	1025	71°02.67'	124°44.82'	345	NBS
		1054	71°02.55'	124°44.43'	322	BC
		1130	71°02.33'	124°43.58'	352	SG
		1227	71°01.95'	124°42.07'	395	C
16	11.8.77	0550	70°48.62'	125°02.22'	300	NBS
		0636	70°48.42'	125°02.63'	310	BC
		0714	70°48.25'	125°02.97'	310	SG
17	11.8.77	0200	70°35.47'	125°15.85'	250	NBS
		0232	70°35.22'	125°15.47'	251	BC
		0248	70°35.03'	125°15.35'	244	SG
		0305	70°34.78'	125°15.27'	236	C
19	14.8.77	0825	70°16.52'	126°59.65'	120	NBS
		0847	70°16.57'	126°59.95'	117	BC
		0857	70°16.58'	127°00.18'	115	SG
		0922	70°16.65'	127°00.50'	112	C

Station	Date	Time;GMT	Location N	Location W	Sonic Depth (m)	Comments*
20	14.8.77	1210	70°36.52'	126°37.42'	346	NBS
		1238	70°36.48'	126°37.32'	350	BC
		1300	70°36.47'	126°37.22'	345	SG
		1336	70°36.52'	126°37.08'	345	C
		1352	70°36.48'	126°37.05'	345	B
21	14.8.77	1615	70°55.25'	126°27.47'	343	NBS
		1640	70°55.25'	126°27.67'	342	BC
		1654	70°55.25'	126°27.82'	345	SG
		1845	70°54.88'	126°29.55'	336	B
22	14.8.77	2135	71°17.20'	126°25.68'	460	NBS
		2200	71°17.12'	126°25.18'	461	BC
		2312	71°16.88'	126°24.15'	459	C
		2329	71°16.83'	126°23.80'	460	B
23	15.8.77	0157	71°37.42'	126°28.87'	470	NBS
		0338	71°37.08'	126°27.12'	467	C
		0352	71°37.00'	126°26.93'	467	B
		0410	71°36.97'	126°26.80'	467	BC
24	21.8.77	1330	70°36.00'	121°46.90'	538	NBS
		1353	70°36.03'	121°46.97'	534	BC
		1457	70°36.12'	121°47.15'	536	B
		1510	70°36.17'	121°47.10'	520	C

Station	Date	Time:GMT	Location N	Location W	Sonic Depth (m)	Comments*
25	21.8.77	1905	70°12.38'	121°19.05'	398	NBS
		1932	70°12.35'	121°19.27'	397	BC
		2000	70°12.32'	121°19.50'	397	SG
		2023	70°12.23'	121°19.65'	397	B
		2104	70°12.28'	121°19.85'	398	C
26	21.8.77	2248	69°59.53'	121°09.17'	370	NBS
		2320	69°59.20'	121°09.00'	379	BC
		2334	69°58.90'	121°08.83'	380	SG
		0006	69°58.67'	121°08.67'	384	B
		0016	69°58.53'	121°08.72'	378	C
27	29.8.77	1625	70°34.28'	119°19.02'	337	NBS
		1650	70°34.20'	119°19.63'	337	BC
		1754	70°33.95'	119°21.50'	329	B
		1811	70°33.90'	119°22.02'	329	C
28	29.8.77	2140	71°01.72'	119°11.95'	168	NBS
		2215	71°01.75'	119°11.28'	170	BC
		2236	71°01.77'	119°10.70'	170	SG
		2252	71°01.88'	119°10.40'	170	B
		2306	71°01.87'	119°10.23'	170	C

Station	Date	Time;GMT	LOCATION N	LOCATION W	Sonic Depth (m)	Comments*
29	30.8.77	0140	71°22.42'	119°04.30'	120	NBS
		0158	71°22.35'	119°04.68'	123	BC
		0229	71°22.25'	119°05.17'	124	B
		0241	71°22.20'	119°05.52'	124	C
30	6.9.77	1658	70°34.47'	120°25.95'	320	NBS
		1728	70°34.50'	120°26.02'	320	BC
		1811	70°34.57'	120°26.15'	320	C
		1825	70°34.67'	120°26.45'	320	B
31	6.9.77	2020	70°49.10'	120°34.17'	270	NBS
		2050	70°49.12'	120°34.20'	270	BC
		2119	70°49.13'	120°34.23'	270	B
		2130	70°49.15'	120°34.28'	270	C
32	6.9.77	2307	71°01.77'	120°40.62'	183	NBS
		2337	71°01.93'	120°40.97'	183	BC
		0003	71°02.08'	120°41.28'	183	B

Comments
NBS - National Bureau of Standards Hydrocarbon Sampler
BC - Bottle Cast (Salinity, Temperature, Oxygen, Nutrients, Particles)
SG - Shipek Grab (Hydrocarbon Sample + Geological Description)
B - Blumer Bottle (Hydrocarbons)
C - Gravity Core

TABLE 2

AMUNDSEN GULF NET HAUL TRACKS

A. MILLER NET HAULS

NET HAUL #	START		FINISH		DISTANCE (nautical miles)
	LATITUDE	LONGITUDE	LATITUDE	LONGITUDE	
M-1	70°25.9'(±0.1')	127°11.2'(±0.2')	70°32.3'	127°5.1'	6.7 (±0.1)
M-2	70°41.5'	126°58.9'	70°47.2'	126°57.8'	5.5
M-3	71°17.7'	124°29.5'	71°14.3'	124°32.6'	3.7
M-4	70°39.8'	125°10.9'	70°31.7'	125°20.3'	8.8
M-5	70°30.5'	125°34.2'	70°32.5'	125°49.2'	5.4
M-6	70°33.6'	125°59.1'	70°35.1'	126°12.8'	4.8
M-7	71°36.7'	126°27.8'	71°30.6'	126°27.7'	6.8
M-8	71°26.0'	126°26.0'	71°22.1'	126°25.6'	4.1
M-9	71°16.8'	126°25.4'	71°06.5	126°25.8'	10.2
M-10	71°03.2'	126°26.1'	70°55.5'	126°27.2'	7.5
M-11	70°50.0'	126°29.5'	70°44.0'	126°32.0'	6.3
M-12	70°48.9'	125°04.0'	70°44.5'	124°42.2'	8.7
M-13	70°41.8'	124°29.6'	70°36.2'	124°04.3'	10.2
M-14	70°26.8'	123°21.9'	70°22.5'	123°10.4'	5.2
M-15	70°21.6'	123°06.7'	70°06.4'	122°23.0'	21.2
M-16	69°55.0'	121°07.2'	70°02.8'	121°11.3'	7.8
M-17	70°04.9'	121°13.0'	70°13.8'	121°20.5'	9.3
M-18	70°15.4'	121°21.9'	70°23.6'	121°30.6'	8.7
M-19	70°25.4'	121°33.0'	70°32.2'	121°42.7'	7.4
M-20	71°22.4'	119°04.1'	71°11.1'	119°08.4'	11.1
M-21	71°08.7'	119°09.8'	70°58.7'	119°12.8'	9.9
M-22	70°56.0'	119°13.7'	70°46.3'	119°16.3'	9.5
M-23	70°44.8'	119°16.7'	70°34.0'	119°18.4'	10.0
M-24	70°58.9'	120°38.1'	70°50.1'	120°33.5'	9.0
M-25	70°48.8'	120°33.2'	70°39.7'	120°28.5'	9.3
M-26	70°39.0'	120°28.0'	70°34.7'	120°25.9'	4.6
M-27	70°24.1'	121°30.6'	70°40.4'	121°52.4'	17.8
M-28	70°41.3'	121°54.5'	70°55.6'	122°17.4'	16.4

A. MILLER NET HAULS continued

NET HAUL #	START		FINISH		DISTANCE (nautical miles)
	LATITUDE	LONGITUDE	LATITUDE	LONGITUDE	
M-29	70°47.9'	124°29.8'	70°57.9'	123°39.0'	19.5
M-30	70°57.9'	123°38.3'	71°00.2'	123°21.1'	6.2

B. NEUSTON NET HAULS

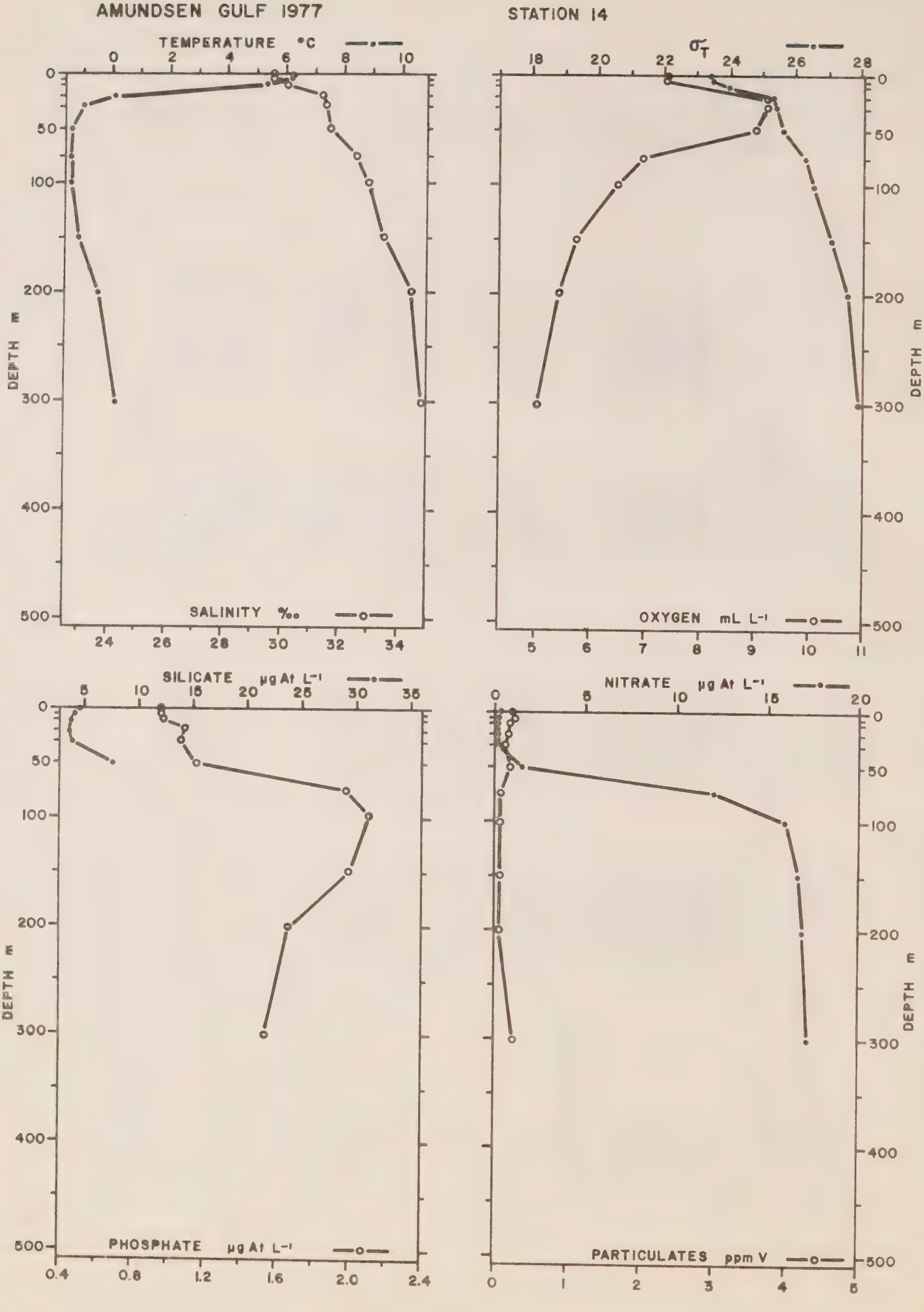
N-1	70°28.2'	127°09.8'	70°31.5'	127°06.0'	3.9
N-2	70°42.7'	126°58.9'	70°46.4'	126°58.3'	3.6
N-3	71°15.5'	127°03.4'	71°17.8'	127°04.9'	2.5
N-4	71°17.9'	124°29.8'	71°15.1'	124°32.8'	3.2
N-5	70°38.7'	125°13.3'	70°33.8'	125°18.6'	5.3
N-6	70°30.8'	125°34.2'	70°32.5'	125°47.0'	4.7
N-7	70°33.6'	125°58.9'	70°34.9'	126°11.2'	4.3
N-8	71°36.5'	126°28.6'	71°32.1'	126°27.9'	4.4
N-9	71°25.1'	126°26.8'	71°22.9'	126°26.5'	2.4
N-10	71°15.7'	126°26.5'	71°07.4'	126°26.7'	8.4
N-11	71°01.8'	126°27.3'	70°52.8'	126°29.4'	9.0
N-12	70°50.0'	126°30.2'	70°44.9'	126°32.7'	5.6
N-13	70°48.3'	124°58.7'	70°45.2'	124°42.3'	5.8
N-14	70°42.2'	124°29.4'	70°39.8'	124°19.0'	4.3
N-15	70°26.3'	123°22.3'	70°23.3'	123°11.8'	4.7
N-16	70°21.2'	123°06.6'	70°06.9'	122°23.1'	20.0
N-17	69°56.4'	121°08.4'	70°01.8'	121°11.6'	5.5
N-18	70°05.5'	121°13.9'	70°11.1'	121°18.7'	6.0
N-19	70°15.6'	121°23.0'	70°22.7'	121°30.4'	7.5
N-20	70°25.2'	121°33.9'	70°31.8'	121°42.0'	7.0
N-21	71°21.1'	119°05.3'	71°12.2'	119°08.8'	9.1
N-22	71°08.6'	119°10.5'	70°59.8'	119°13.6'	9.3
N-23	70°55.7'	119°14.7'	70°47.3'	119°17.3'	8.3
N-24	70°44.9'	119°17.8'	70°36.1'	119°19.1'	9.0

B. NEUSTON NET HAULS continued

NET HAUL #	START		FINISH		DISTANCE (nautical miles)
	LATITUDE	LONGITUDE	LATITUDE	LONGITUDE	
N-25	70°58.3'	120°37.9'	70°50.6'	120°35.0'	7.8
N-26	70°47.7'	120°33.4'	70°40.9'	120°30.0'	7.5
N-27	70°38.4'	120°28.6'	70°35.5'	120°27.3'	3.0

C. SCOR NET HAUL

S-1	71°13.7'	127°01.8'	71°18.8'	127°05.1	4.6



AMUNDSEN GULF 1977
STATION 14
TEMPERATURE °C
SALINITY ‰
DEPTH m
σ_T
OXYGEN mL L⁻¹
SILICATE µg At L⁻¹
PHOSPHATE µg At L⁻¹
NITRATE µg At L⁻¹
PARTICULATES ppm V

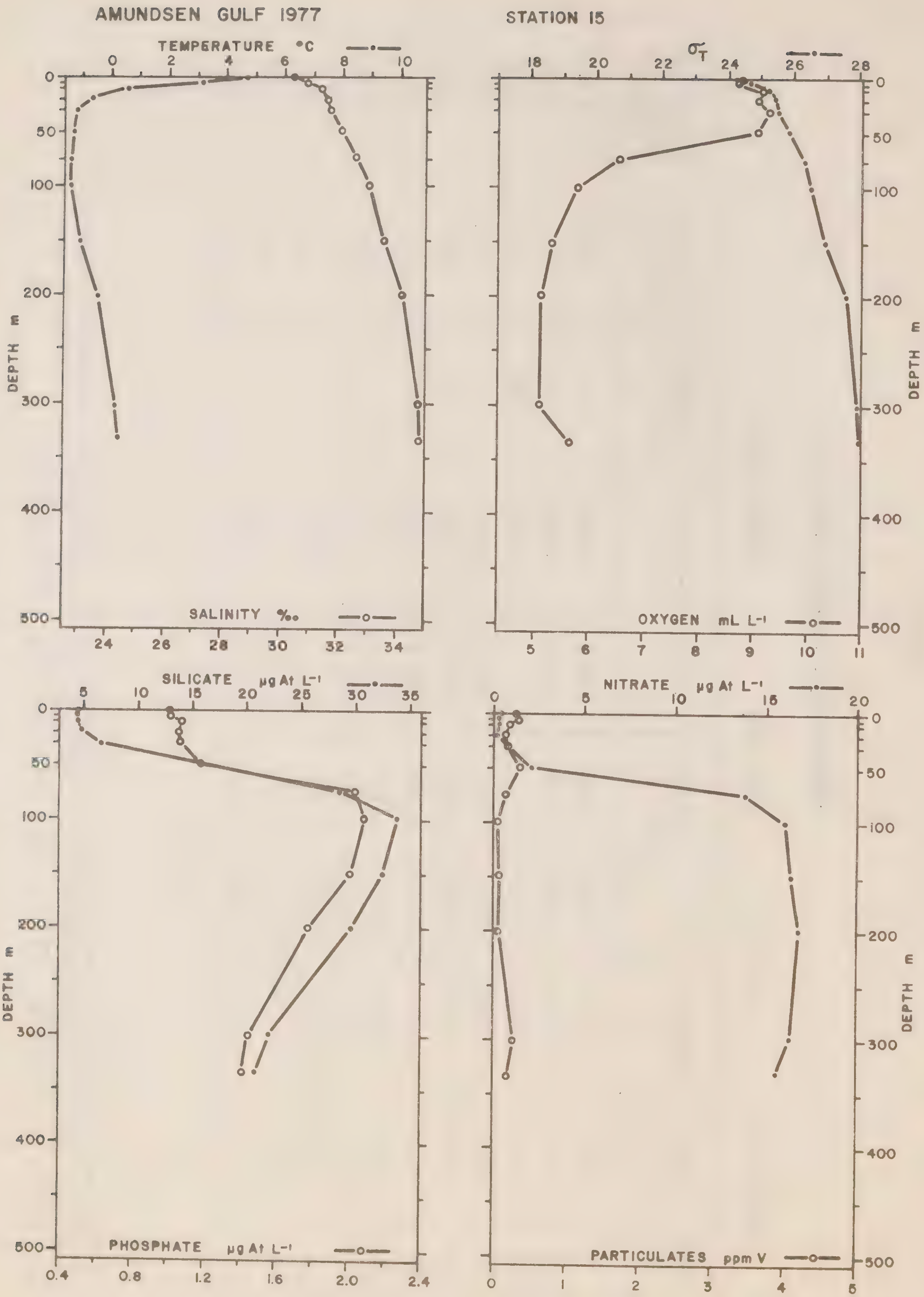
TABLE 3

AMUNDSEN GULF CHEMICAL DATA 1977

STATION 014 11/8/77 1457 GMT DEPTH 330 m

DEPTH (m)	TEMP. (^oC)	SALINITY ($^o/oo$)	σ_T	OXYGEN (mL L^{-1})	OXYGEN % SAT'N	PHOSPHATE (μg at L^{-1})	SILICATE (μg at L^{-1})	NITRATE (μg at L^{-1})	SUSPENDED PARTICLES (ppmV)
0	6.25	29.775	23.43	7.468	104.9	0.96	4.4	0.2	0.267
5	6.22	29.780	23.44	7.429	104.3	0.96	4.1	0.1	0.252
10	5.37	30.232	23.89	-	-	0.98	3.9	0.1	0.212
20	0.03	31.469	25.28	9.224	112.0	1.09	3.7	0.1	0.161
30	-0.96	31.551	25.38	9.235	109.3	1.07	3.9	0.1	0.139
50	-1.39	31.771	25.57	9.054	106.0	1.16	7.7	1.4	0.167
75	-1.51	32.538	26.19	6.981	81.9	1.89	-	12.1	0.042
100	-1.43	32.951	26.52	6.501	76.7	2.10	-	15.8	0.068
150	-1.05	33.576	27.02	5.754	68.9	2.00	-	16.6	0.045
200*	-0.47	34.270	27.56	5.391	65.9	1.67	-	16.7	0.068
300	0.16	34.716	27.89	5.059	63.0	1.54	-	17.2	0.237

* Unprotected thermometer gave an anomalous depth of 235 m. Salinity and Temperature seem to indicate that the bottle tripped at a depth shallower than 200 m. Exactly the same anomaly occurred at Station 15. The effect may be real but should be viewed with suspicion.

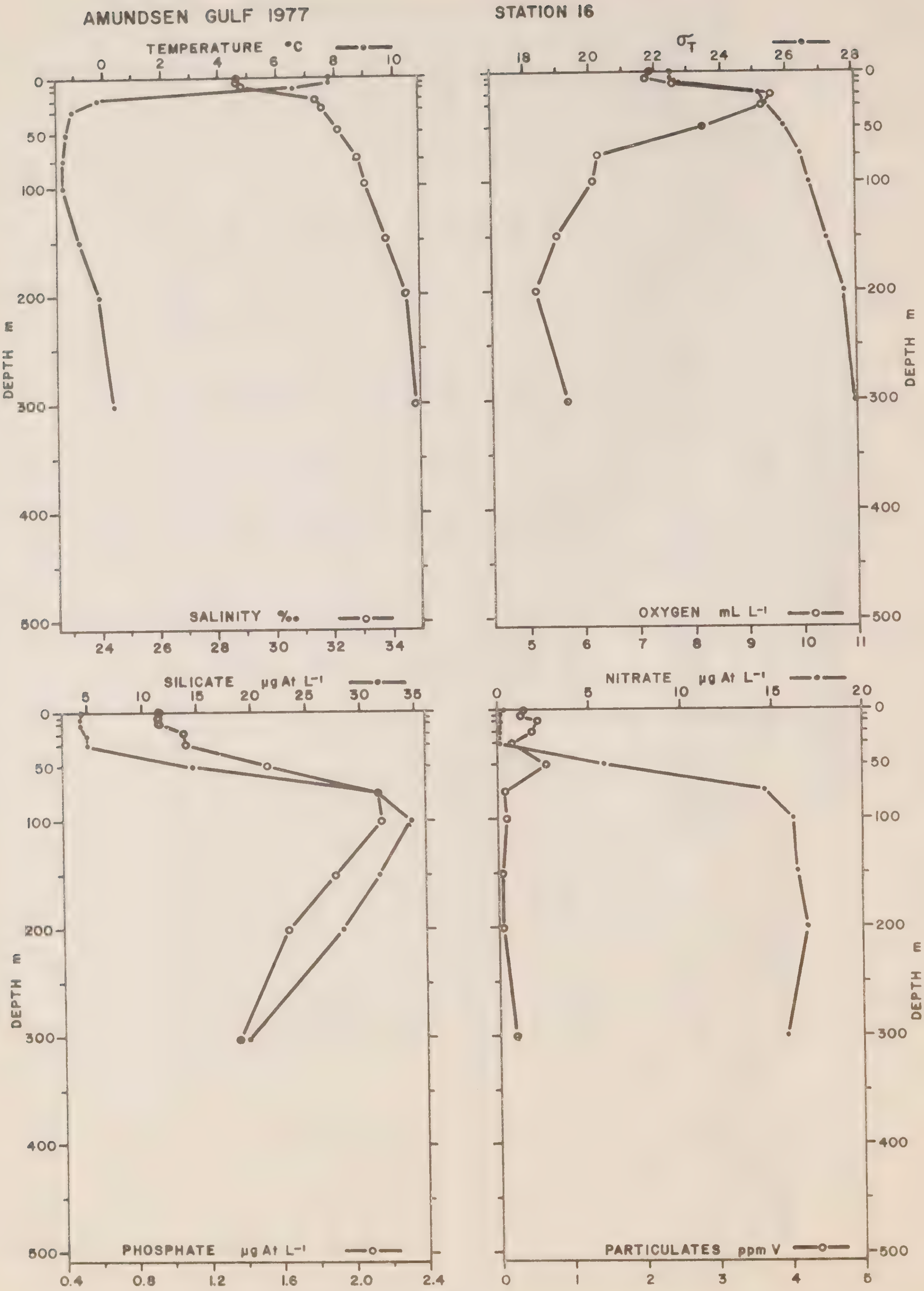

AMUNDSEN GULF 1977
STATION 15
TEMPERATURE °C
0 2 4 6 8 10
SALINITY ‰
24 26 28 30 32 34
DEPTH m
0 50 100 200 300 400 500
σT
18 20 22 24 26 28
OXYGEN mL L-1
5 6 7 8 9 10 11
SILICATE μg At L-1
5 10 15 20 25 30 35
PHOSPHATE μg At L-1
0.4 0.8 1.2 1.6 2.0 2.4
NITRATE μg At L-1
0 5 10 15 20
PARTICULATES ppm V
0 1 2 3 4 5

AMUNDSEN GULF CHEMICAL DATA 1977

STATION 015 11/8/77 1055 GMT DEPTH 345 m

DEPTH (m)	TEMP. (^{o}C)	SALINITY ($^{o}/oo$)	σ_T	OXYGEN (mL L^{-1})	OXYGEN % SAT'N	PHOSPHATE (μg at L^{-1})	SILICATE (μg at L^{-1})	NITRATE (μg at L^{-1})	SUSPENDED PARTICLES (ppmV)
0	4.63	30.548	24.21	-	-	1.00	4.6	0.3	0.270
5	3.07	30.929	24.66	8.723	114.2	1.02	4.5	0.2	0.319
10	0.56	31.451	25.25	9.252	113.9	1.07	4.5	0.2	0.190
20	-0.68	31.579	25.40	9.138	109.0	1.06	4.9	0.1	0.145
30	-1.19	31.669	25.48	9.340	109.9	1.07	6.6	0.7	0.151
50	-1.28	32.129	25.85	9.130	107.5	1.18	3.4	2.0	0.341
75	-1.48	32.671	26.30	6.610	77.7	2.05	28.7	13.9	0.151
100	-1.42	33.048	26.48	5.831	68.8	2.10	33.8	15.9	0.050
150	-1.06	33.481	26.94	5.362	64.1	1.99	32.6	16.2	0.084
200*	-0.49	34.254	27.55	5.122	62.5	1.78	29.5	16.8	0.054
300	0.17	34.733	27.90	5.139	64.1	1.44	22.1	16.4	0.248
330	0.21	34.774	27.94	5.654	70.6	1.42	20.8	15.6	0.184

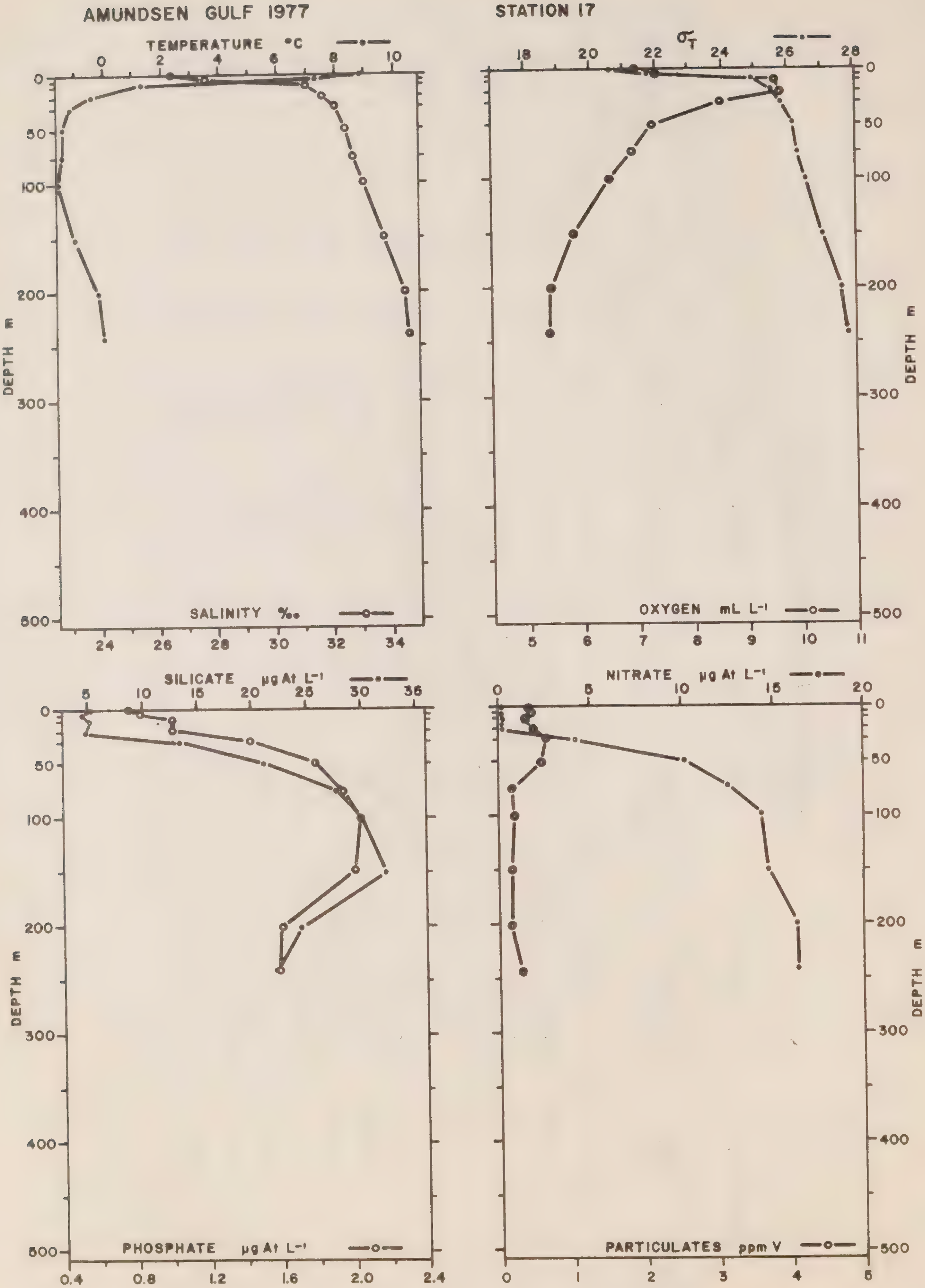
* See Station 14


AMUNDSEN GULF 1977
STATION 16
TEMPERATURE °C
SALINITY ‰
DEPTH m
σT
OXYGEN mL L⁻¹
SILICATE µg At L⁻¹
PHOSPHATE µg At L⁻¹
NITRATE µg At L⁻¹
PARTICULATES ppm V

AMUNDSEN GULF CHEMICAL DATA 1977

STATION 016 11/8/77 0635 GMT DEPTH 310 m

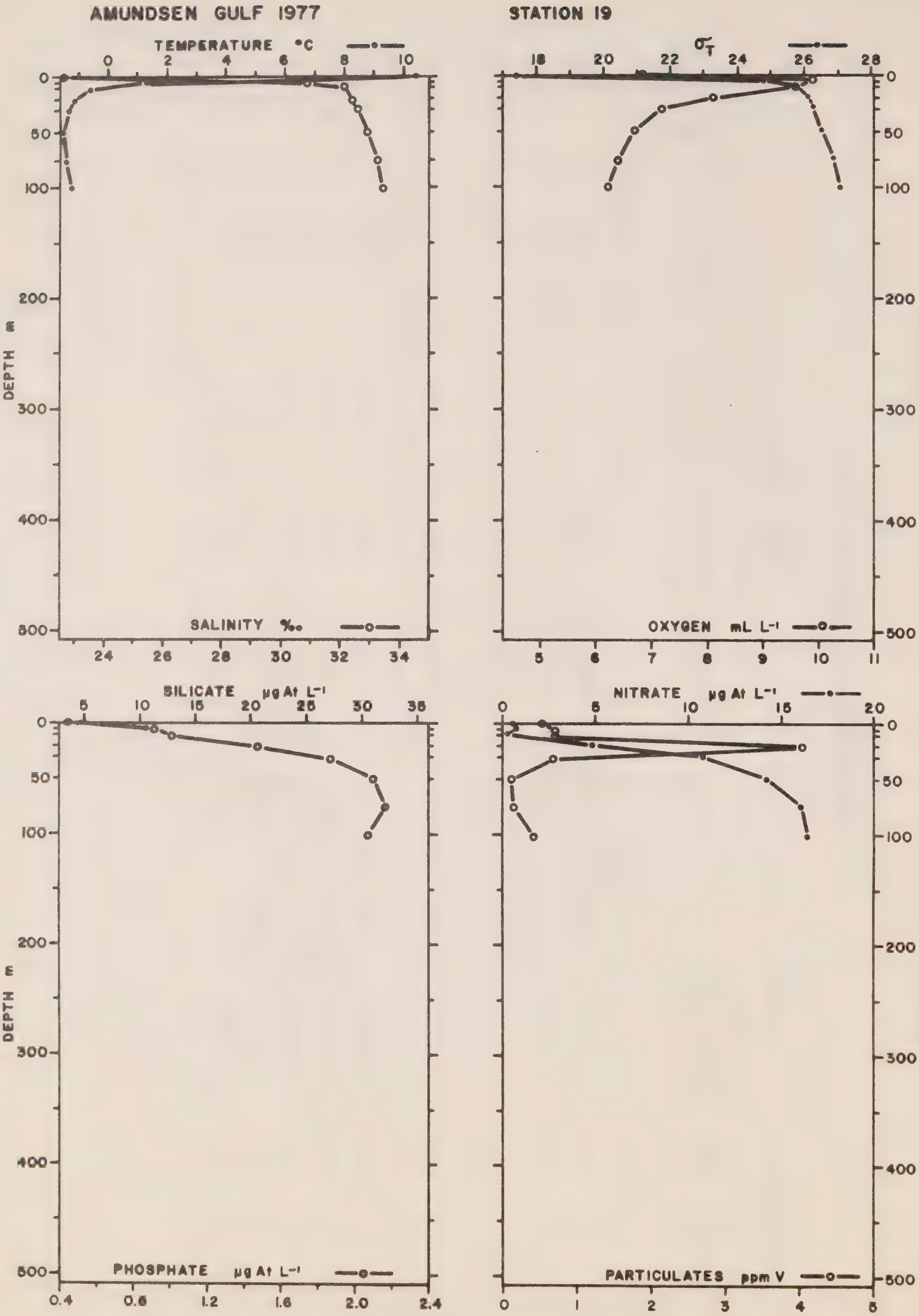
DEPTH (m)	TEMP. (^{o}C)	SALINITY (^{o}/oo)	σ_T	OXYGEN (mL L^{-1})	OXYGEN % SAT'N	PHOSPHATE (µg at L^{-1})	SILICATE (µg at L^{-1})	NITRATE (µg at L^{-1})	SUSPENDED PARTICLES (ppmV)
0	7.79	28.792	22.46	7.187	104.0	0.93	4.3	0.3	0.346
5	7.78	28.788	22.46	7.086	102.5	0.92	4.3	0.1	0.299
10	6.65	29.023	22.79	7.659	108.1	0.92	4.3	0.1	0.473
20	-0.13	31.373	25.21	9.458	114.3	1.06	5.1	0.1	0.403
30	-0.97	31.610	25.43	9.312	110.2	1.07	5.1	0.1	0.207
50	-1.28	32.238	25.94	8.230	97.0	1.53	14.6	5.8	0.666
75	-1.48	32.791	26.39	6.310	74.2	2.12	31.5	14.7	0.060
100	-1.41	33.112	26.65	6.176	73.0	2.15	34.8	16.3	0.097
150	-0.77	33.849	27.23	5.539	66.9	1.88	31.6	16.5	0.046
200	-0.21	34.475	27.72	5.139	63.3	1.62	28.3	17.0	0.048
300	0.23	34.797	27.95	5.717	71.4	1.37	19.5	15.7	0.195


AMUNDSEN GULF 1977
STATION 17
TEMPERATURE °C
SALINITY ‰
DEPTH m
σ_T
OXYGEN mL L⁻¹
SILICATE µg At L⁻¹
PHOSPHATE µg At L⁻¹
NITRATE µg At L⁻¹
PARTICULATES ppm V

AMUNDSEN GULF CHEMICAL DATA 1977

STATION 017 11/8/77 0232 GMT DEPTH 250 m

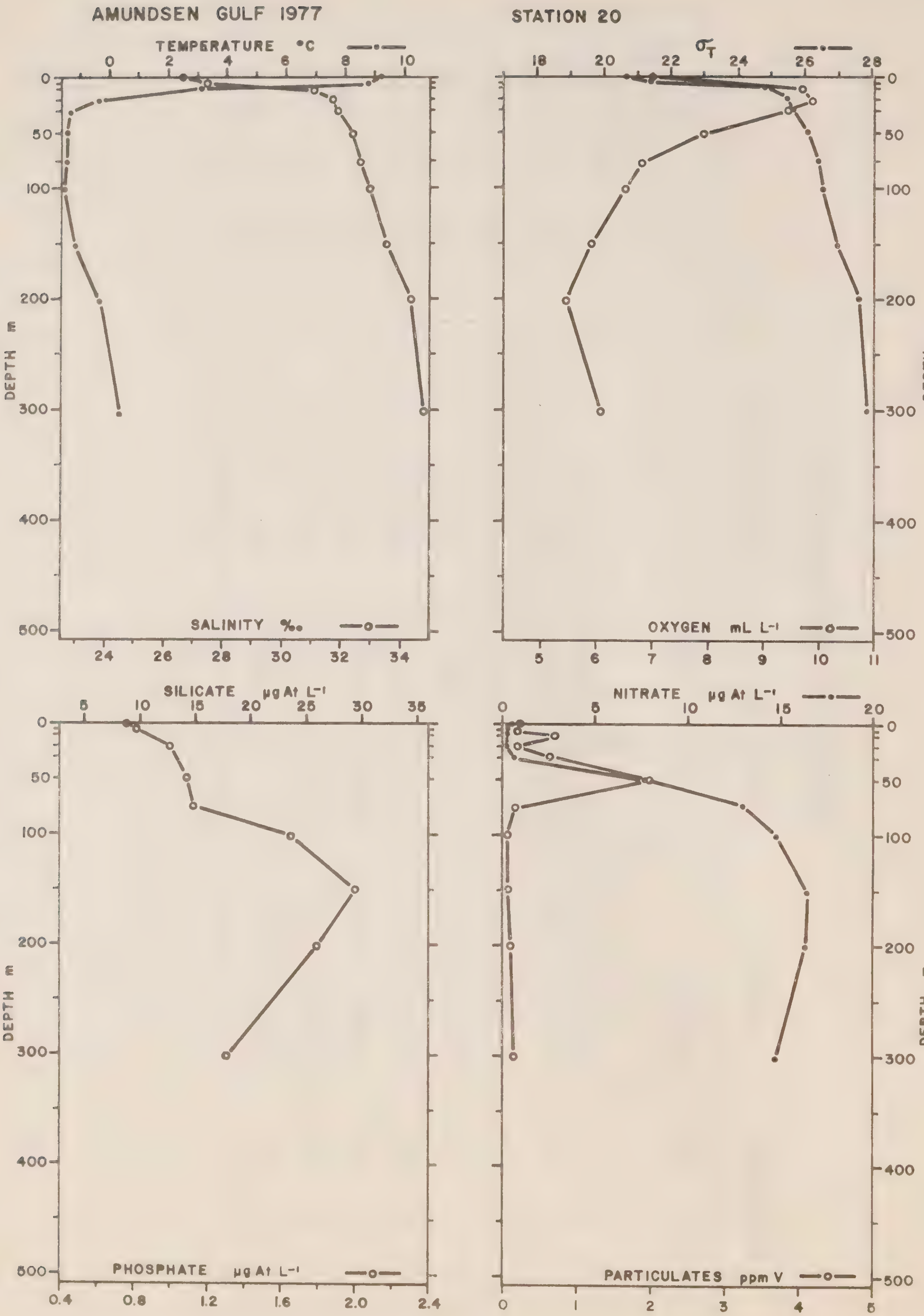
DEPTH (m)	TEMP. (^{o}C)	SALINITY (^{o}/oo)	σ_T	OXYGEN (mL L^{-1})	OXYGEN % SAT'N	PHOSPHATE (µg at L^{-1})	SILICATE (µg at L^{-1})	NITRATE (µg at L^{-1})	SUSPENDED PARTICLES (ppmV)
0	8.84	26.558	20.58	7.026	102.7	0.76	5.2	0.1	0.409
5	7.30	27.780	21.74	7.345	104.4	0.82	4.7	0.1	0.421
10	1.43	31.145	24.95	9.491	119.3	1.03	5.2	0.1	0.323
20	-0.35	31.721	25.50	9.660	116.3	1.03	4.9	0.1	0.477
30	-1.12	32.088	25.82	8.509	100.6	1.42	13.5	4.2	0.628
50	-1.43	32.544	26.19	7.259	85.4	1.79	21.1	10.2	0.605
75	-1.36	32.800	26.40	6.880	81.2	1.95	27.8	12.7	0.161
100	-1.52	33.037	26.59	6.511	76.6	2.04	30.0	14.4	0.163
150	-1.03	33.694	27.12	5.817	69.7	2.00	32.2	14.7	0.150
200	-0.24	34.477	27.72	5.389	66.3	1.60	24.6	16.3	0.131
240	-0.10	34.568	27.79	5.360	66.3	1.58	22.0	16.4	0.283


AMUNDSEN GULF 1977
STATION 19
TEMPERATURE °C
SALINITY ‰
σ_T
OXYGEN mL L⁻¹
SILICATE µg At L⁻¹
PHOSPHATE µg At L⁻¹
NITRATE µg At L⁻¹
PARTICULATES ppm V
DEPTH m

AMUNDSEN GULF CHEMICAL DATA 1977

STATION 019 14/8/77 0845 GMT DEPTH 120 m

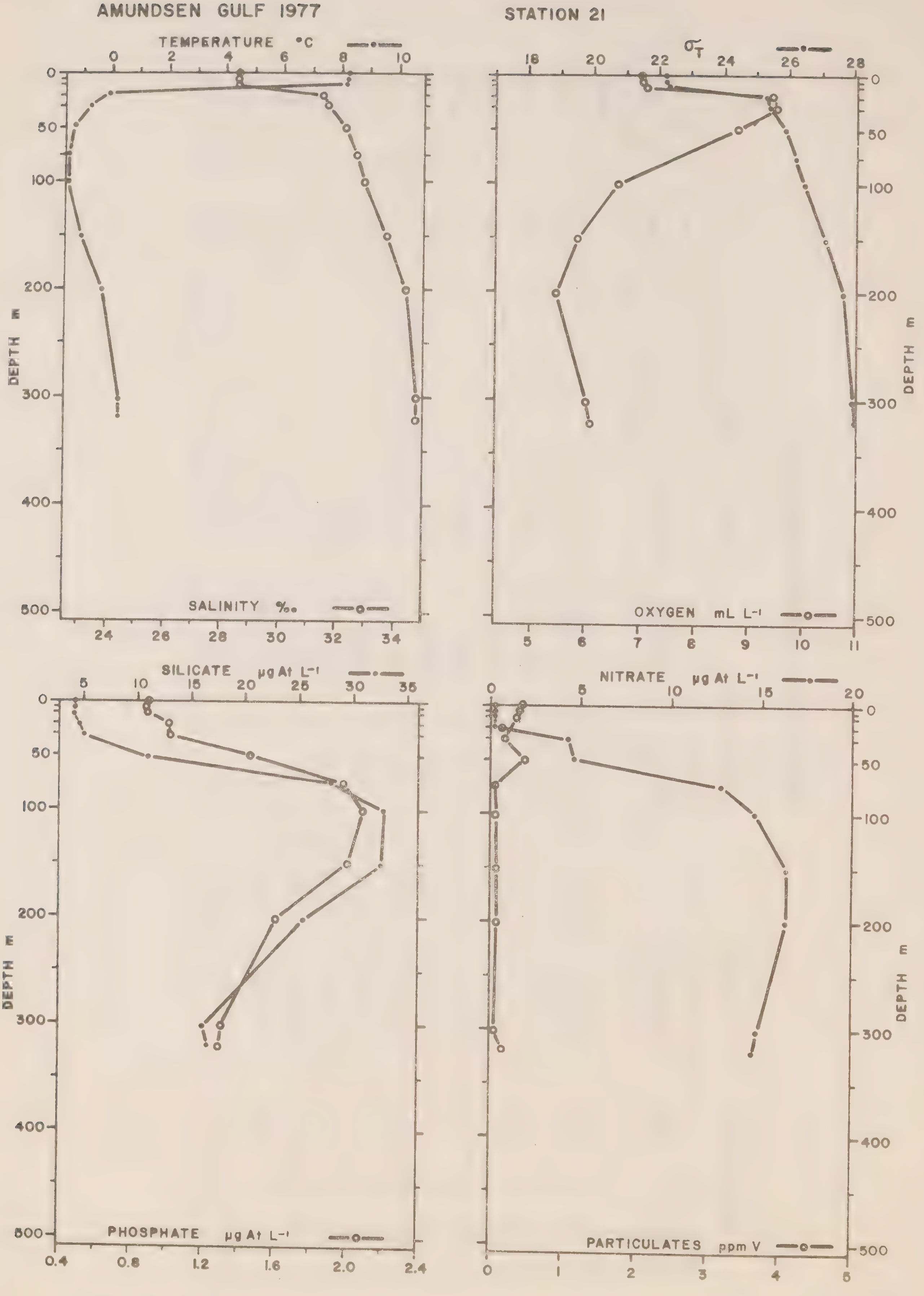
DEPTH (m)	TEMP. (^{o}C)	SALINITY (^{o}/oo)	σ_T	OXYGEN (mL L^{-1})	OXYGEN % SAT'N	PHOSPHATE (μg at L^{-1})	SILICATE (μg at L^{-1})	NITRATE (μg at L^{-1})	SUSPENDED PARTICLES (ppmV)
0	10.41	22.716	17.37	6.826	100.8	0.45	-	0.5	0.523
5	1.26	30.958	24.81	9.876	123.5	0.91	-	0.7	0.662
10	-0.66	32.096	25.81	9.619	115.2	1.05	-	0.2	0.695
20	-1.21	32.443	26.11	8.131	96.1	1.47	-	4.8	4.05
30	-1.41	32.609	26.24	7.171	84.4	1.85	-	11.4	0.667
50	-1.55	32.900	26.48	6.700	78.7	2.09	-	14.2	0.084
75	-1.44	33.348	26.84	6.356	75.1	2.15	-	16.2	0.103
100	-1.31	33.501	26.97	6.171	73.3	2.06	-	16.5	0.396


AMUNDSEN GULF 1977
STATION 20
TEMPERATURE °C
SALINITY ‰
σT
OXYGEN mL L⁻¹
SILICATE μg At L⁻¹
PHOSPHATE μg At L⁻¹
NITRATE μg At L⁻¹
PARTICULATES ppm V
DEPTH m

AMUNDSEN GULF CHEMICAL DATA 1977

STATION 020 14/8/77 1237 GMT DEPTH 246 m

DEPTH (m)	TEMP. (^oC)	SALINITY ($^o/oo$)	σ_T	OXYGEN (mL L^{-1})	OXYGEN % SAT'N	PHOSPHATE (µg at L^{-1})	SILICATE (µg at L^{-1})	NITRATE (µg at L^{-1})	SUSPENDED PARTICLES (ppmV)
0	9.23	26.691	20.63	6.948	102.5	0.76	-	0.4	0.415
5	8.68	27.605	21.42	7.101	104.1	0.81	-	0.2	0.378
10	3.07	31.121	24.81	9.681	126.9	0.99	-	0.2	0.706
20	-0.37	31.755	25.53	9.863	118.7	1.08	-	0.2	0.219
30	-1.36	31.928	25.69	9.452	110.9	1.12	-	0.6	0.604
50	-1.40	32.413	26.09	7.914	93.1	1.65	-	7.7	1.99
75	-1.53	32.760	26.37	6.820	80.1	1.99	-	13.1	0.149
100	-1.52	32.977	26.54	6.516	76.7	2.04	-	14.8	0.077
150	-1.13	33.593	27.04	5.939	70.9	1.98	-	16.3	0.074
200	-0.29	34.427	27.68	5.465	67.2	1.79	-	16.2	0.096
300	0.31	34.811	27.96	6.084	76.2	1.29	-	14.7	0.106

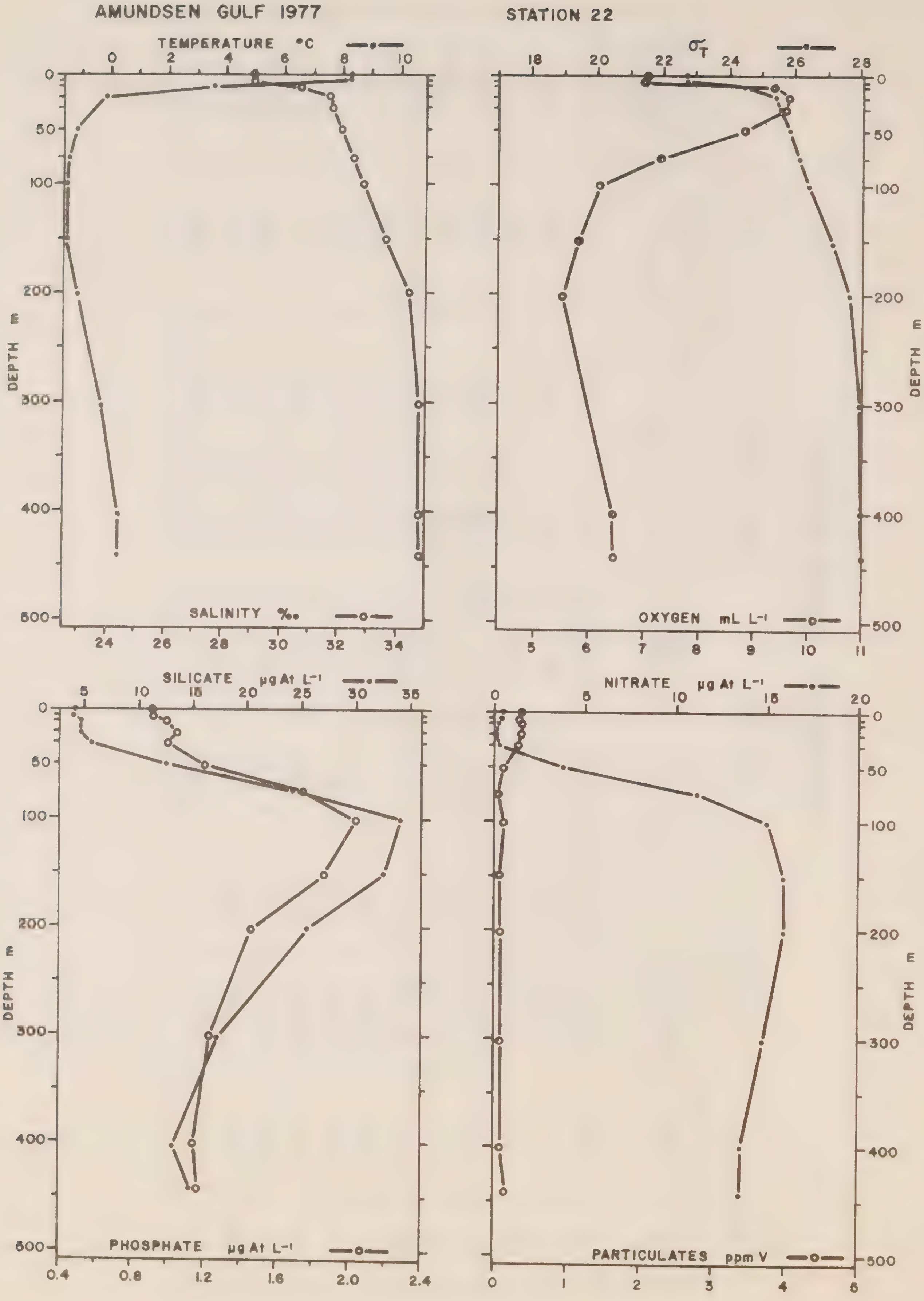


AMUNDSEN GULF 1977
STATION 21
TEMPERATURE °C
SALINITY ‰
σ_T
OXYGEN mL L⁻¹
SILICATE µg At L⁻¹
PHOSPHATE µg At L⁻¹
NITRATE µg At L⁻¹
PARTICULATES ppm V
DEPTH m

AMUNDSEN GULF CHEMICAL DATA 1977

STATION 021 14/8/77 1637 GMT DEPTH 343 m

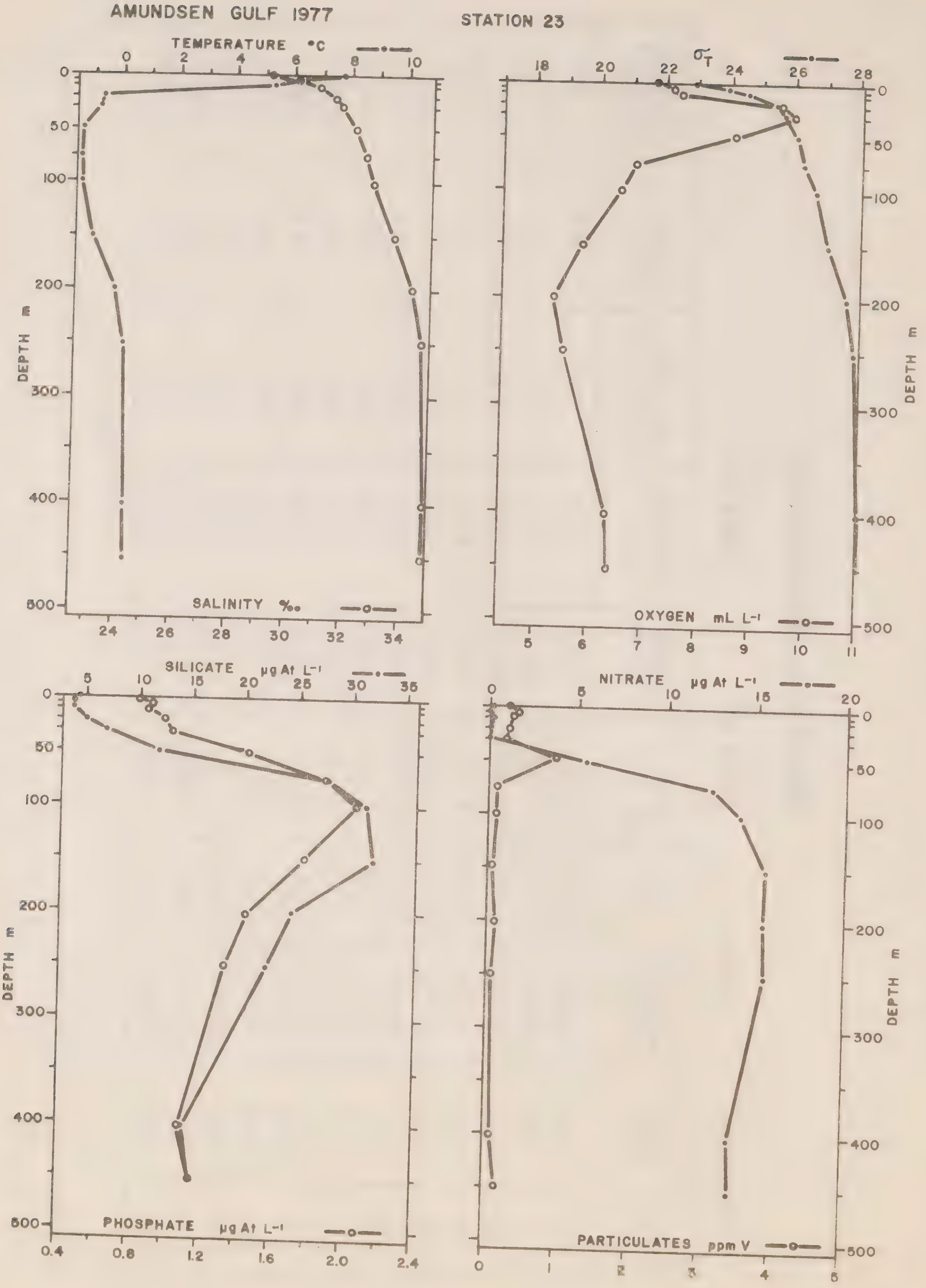
DEPTH (m)	TEMP. (^{o}C)	SALINITY (^{o}/oo)	σ_T	OXYGEN (mL L^{-1})	OXYGEN % SAT'N	PHOSPHATE (μg at L^{-1})	SILICATE (μg at L^{-1})	NITRATE (μg at L^{-1})	SUSPENDED PARTICLES (ppmV)
0	8.17	28.516	22.20	7.087	103.3	0.89	4.2	0.1	0.403
5	8.17	28.522	22.20	7.109	103.6	0.87	4.2	0.1	0.393
10	8.08	28.568	22.25	7.130	103.7	0.89	4.2	0.1	0.374
20	-0.11	31.459	25.28	9.433	114.1	1.06	4.6	0.1	0.221
30	-0.79	31.614	25.43	9.501	113.0	1.08	5.1	4.2	0.187
50	-1.27	32.228	25.93	8.827	104.0	1.47	11.0	4.6	0.462
75	-1.56	32.644	26.28	-	-	1.99	27.9	12.7	0.061
100	-1.53	32.946	26.52	6.603	77.4	2.11	32.6	14.5	0.066
150	-1.05	33.709	27.13	5.846	70.0	2.01	32.5	16.3	0.044
200	-0.28	34.435	27.69	5.457	67.1	1.62	25.4	16.3	0.063
300	0.29	34.797	27.95	6.082	76.1	1.32	16.1	14.6	0.062
320	0.29	34.817	27.97	6.089	76.2	1.30	16.5	14.4	0.141


AMUNDSEN GULF 1977
STATION 22
TEMPERATURE °C
σ_T
SALINITY ‰
OXYGEN mL L⁻¹
SILICATE µg At L⁻¹
NITRATE µg At L⁻¹
PHOSPHATE µg At L⁻¹
PARTICULATES ppm V
DEPTH m

AMUNDSEN GULF CHEMICAL DATA 1977

STATION 022 14/8/77 2159 GMT DEPTH 460 m

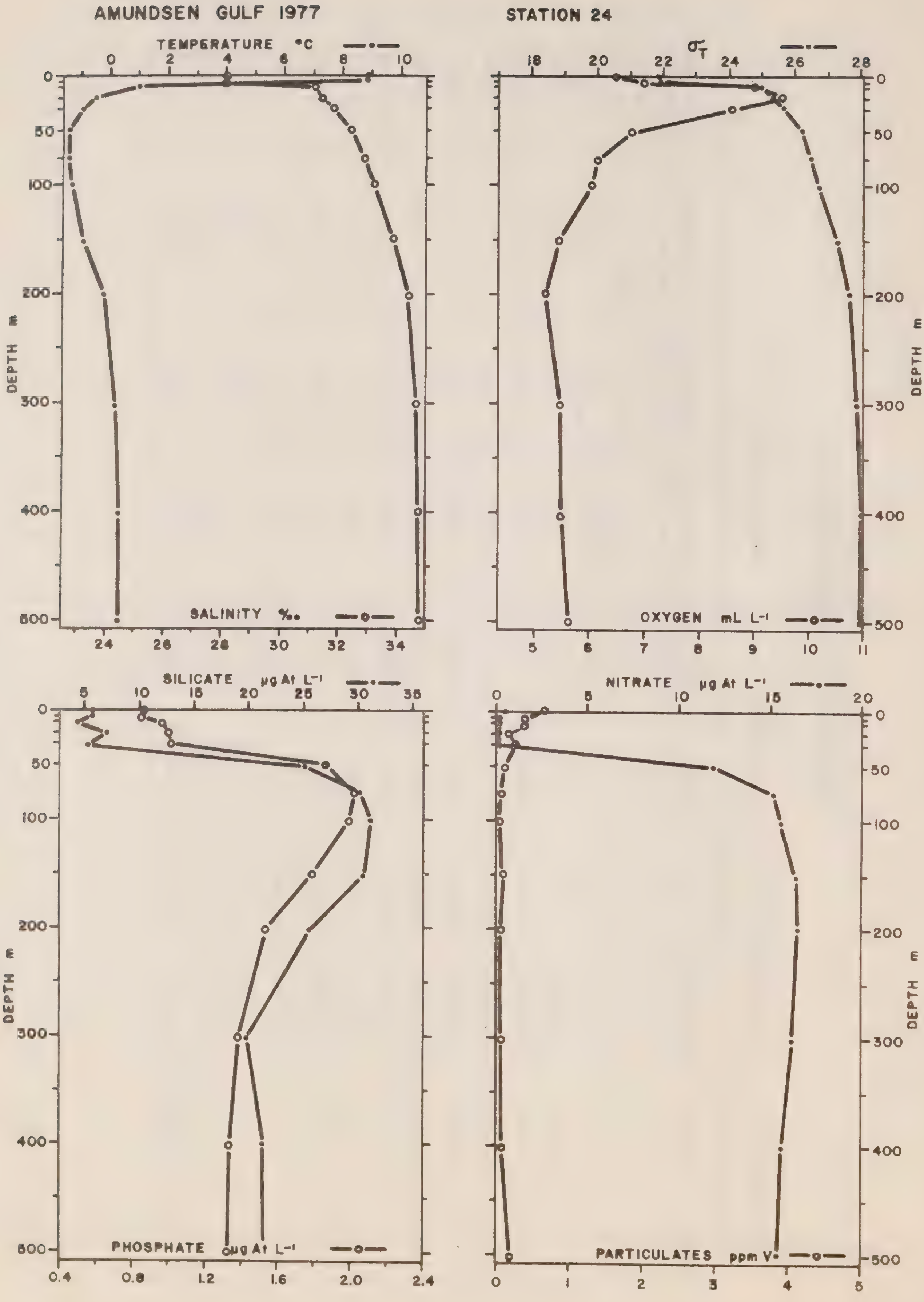
DEPTH (m)	TEMP. (^{o}C)	SALINITY (^{o}/oo)	σ_T	OXYGEN (mL L^{-1})	OXYGEN % SAT'N	PHOSPHATE (μg at L^{-1})	SILICATE (μg at L^{-1})	NITRATE (μg at L^{-1})	SUSPENDED PARTICLES (ppmV)
0	8.29	29.091	22.63	7.043	103.3	0.90	4.0	0.4	0.352
5	8.25	29.135	22.67	7.029	103.0	0.91	4.0	0.4	0.319
10	3.52	30.693	24.44	9.360	123.7	0.99	4.8	0.2	0.355
20	-0.12	31.673	25.45	9.622	116.6	1.05	4.6	0.1	0.329
30	-1.16	31.774	25.57	9.532	112.3	0.99	5.6	0.2	0.328
50	-1.52	32.097	25.83	8.826	103.2	1.31	12.5	3.8	0.107
75	-1.54	32.532	26.18	7.270	85.2	1.75	24.2	11.1	0.066
100	-1.54	32.935	26.51	6.130	72.1	2.05	34.2	14.9	0.092
150	-1.09	33.726	27.14	5.834	69.8	1.86	32.5	15.8	0.061
200	-0.26	34.459	27.71	5.492	67.5	1.47	25.5	15.9	0.059
300	0.26	34.805	27.96	-	-	1.24	17.2	14.7	0.063
400	0.24	34.871	28.01	6.420	80.2	1.14	13.2	13.6	0.055
450	0.27	34.871	28.01	6.381	79.8	1.15	14.7	13.6	0.129


AMUNDSEN GULF 1977
STATION 23
TEMPERATURE °C
SALINITY ‰
DEPTH m
σ_T
OXYGEN mL L⁻¹
DEPTH m
SILICATE µg At L⁻¹
PHOSPHATE µg At L⁻¹
DEPTH m
NITRATE µg At L⁻¹
PARTICULATES ppm V
DEPTH m

AMUNDSEN GULF CHEMICAL DATA 1977

STATION 023 15/8/77 0222 GMT DEPTH 470 m

DEPTH (m)	TEMP. (^{o}C)	SALINITY (^{o}/oo)	σ_T	OXYGEN (mL L^{-1})	OXYGEN % SAT'N	PHOSPHATE (μg at L^{-1})	SILICATE (μg at L^{-1})	NITRATE (μg at L^{-1})	SUSPENDED PARTICLES (ppmV)
0	7.68	29.353	22.92	7.171	103.9	0.83	4.1	0.1	0.278
5	6.38	30.352	23.87	7.465	105.6	0.90	3.8	0	0.371
10	5.34	30.981	24.48	7.609	105.4	0.88	3.8	0.1	0.304
20	-0.72	31.616	25.43	9.490	113.1	0.97	4.8	0	0.208
30	-0.80	31.785	25.57	9.712	115.6	1.01	5.7	0	0.271
50	-1.37	32.354	26.04	8.137	95.7	1.45	11.7	5.4	0.905
75	-1.53	32.711	26.33	6.794	80.0	1.88	27.1	12.5	0.100
100	-1.53	33.012	26.57	6.521	76.7	1.96	31.3	14.1	0.103
150	-1.07	33.724	27.14	5.814	69.6	1.77	31.9	15.6	0.064
200	-0.19	34.381	27.64	5.314	65.4	1.45	24.4	15.1	0.090
250	0.12	34.723	27.90	5.475	68.1	1.34	22.2	15.6	0.067
400	0.25	34.879	28.02	6.324	79.1	1.09	14.5	13.6	0.071
450	0.27	34.877	28.02	6.358	79.5	1.16	15.4	13.7	0.162

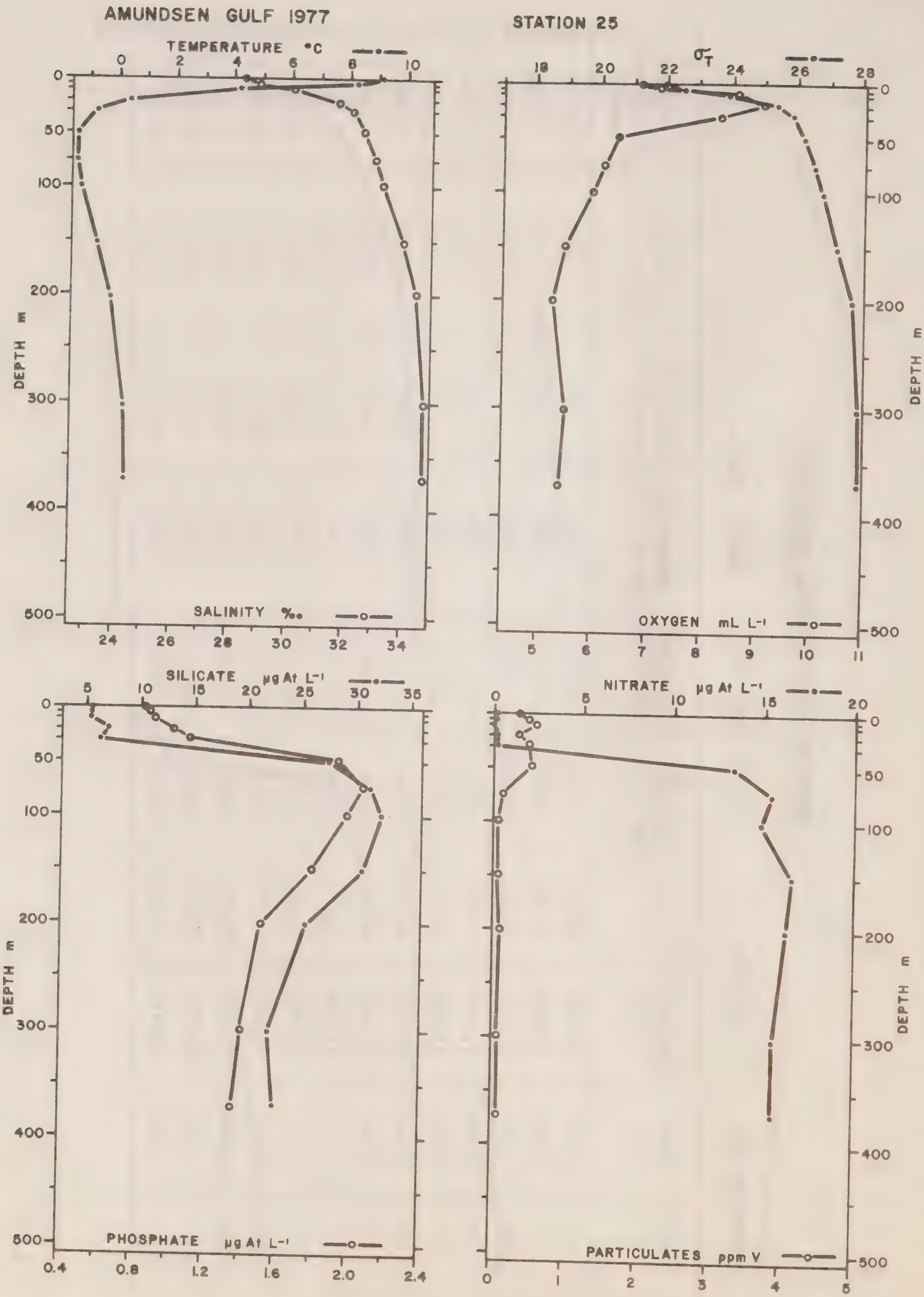


AMUNDSEN GULF 1977
STATION 24
TEMPERATURE °C
SALINITY ‰
DEPTH m
σT
OXYGEN mL L⁻¹
SILICATE μg At L⁻¹
PHOSPHATE μg At L⁻¹
NITRATE μg At L⁻¹
PARTICULATES ppm V

AMUNDSEN GULF CHEMICAL DATA 1977

STATION 024 21/8/77 1353 GMT DEPTH 538 m

DEPTH (m)	TEMP. (^{o}C)	SALINITY ($^{o}/oo$)	σ_T	OXYGEN (mL L^{-1})	OXYGEN % SAT'N	PHOSPHATE (µg at L^{-1})	SILICATE (µg at L^{-1})	NITRATE (µg at L^{-1})	SUSPENDED PARTICLES (ppmV)
0	8.86	28.208	21.86	6.470	95.6	0.86	5.7	0.4	0.616
5	8.82	28.251	21.90	7.035	103.9	0.85	5.7	0.1	0.368
10	1.07	31.233	25.04	9.076	113.1	0.96	4.4	0.1	0.395
20	-0.45	31.484	25.31	9.535	114.3	1.00	7.0	0.1	0.151
30	-0.89	31.904	25.67	8.592	102.1	1.02	5.3	0.1	0.244
50	-1.40	32.537	26.19	6.758	79.5	1.84	25.1	11.9	0.097
75	-1.41	32.912	26.49	6.134	72.4	2.03	30.1	15.1	0.066
100	-1.32	33.258	26.77	6.034	71.5	1.99	31.2	15.6	0.043
150	-0.80	33.913	27.29	5.439	65.7	1.79	30.6	16.5	0.075
200	-0.21	34.471	27.71	5.247	64.6	1.53	25.7	16.5	0.057
300	0.18	34.745	27.91	5.476	68.3	1.38	19.9	16.2	0.058
400	0.22	34.797	27.95	5.477	68.4	1.33	21.3	15.7	0.066
500	0.27	34.811	27.96	5.725	71.6	1.32	21.5	15.3	0.177

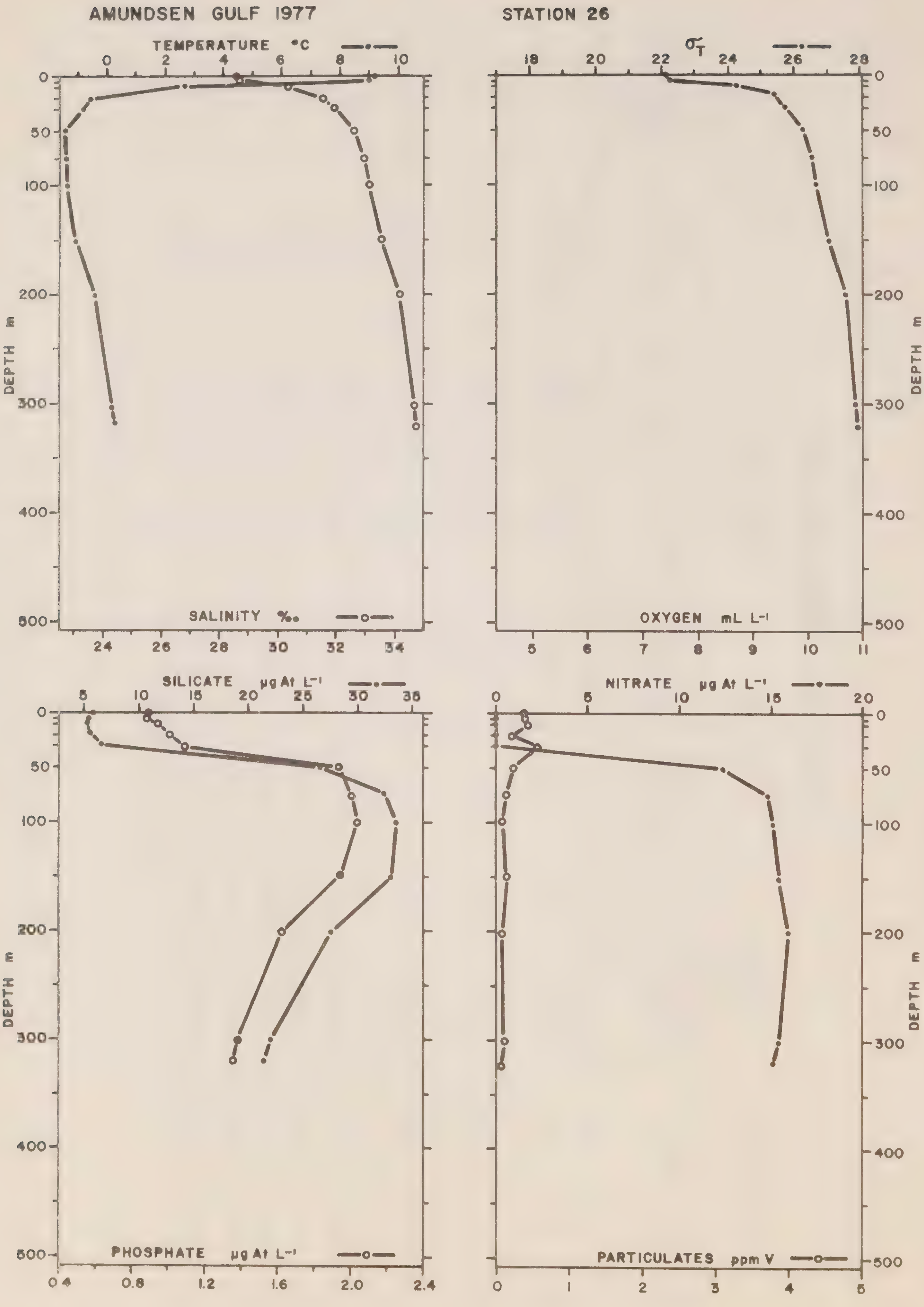


AMUNDSEN GULF 1977
STATION 25
TEMPERATURE °C
SALINITY ‰
DEPTH m
σT
OXYGEN mL L-1
SILICATE µg At L-1
PHOSPHATE µg At L-1
NITRATE µg At L-1
PARTICULATES ppm V

AMUNDSEN GULF CHEMICAL DATA 1977

STATION 025 21/8/77 1929 GMT DEPTH 398 m

DEPTH (m)	TEMP. (^{o}C)	SALINITY ($^{o}/oo$)	σ_T	OXYGEN (mL L^{-1})	OXYGEN % SAT'N	PHOSPHATE (µg at L^{-1})	SILICATE (µg at L^{-1})	NITRATE (µg at L^{-1})	SUSPENDED PARTICLES (ppmV)
0	9.11	28.411	21.98	6.864	102.1	0.85	5.5	0.1	0.355
5	8.25	28.936	22.51	7.222	105.7	0.87	5.5	0.1	0.452
10	4.25	30.128	23.92	8.663	116.2	0.91	5.5	0	0.594
20	0.43	31.669	25.43	9.175	112.6	1.00	7.0	0.1	0.317
30	-0.69	32.167	25.87	8.377	100.3	1.11	6.2	0.1	0.485
50	-1.39	32.634	26.26	6.444	75.9	1.93	27.3	13.4	0.450
75	-1.44	32.978	26.54	6.238	73.6	2.07	31.0	15.4	0.123
100	-1.30	33.276	26.78	6.010	71.3	1.98	32.0	14.8	0.066
150	-0.80	33.967	27.33	5.481	66.2	1.79	30.3	16.5	0.064
200	-0.17	34.516	27.75	5.239	64.6	1.52	25.2	16.3	0.108
300	0.19	34.759	27.94	5.516	68.8	1.40	21.9	15.6	0.076
370	0.23	34.808	27.96	5.400	67.4	1.36	22.5	15.5	0.084

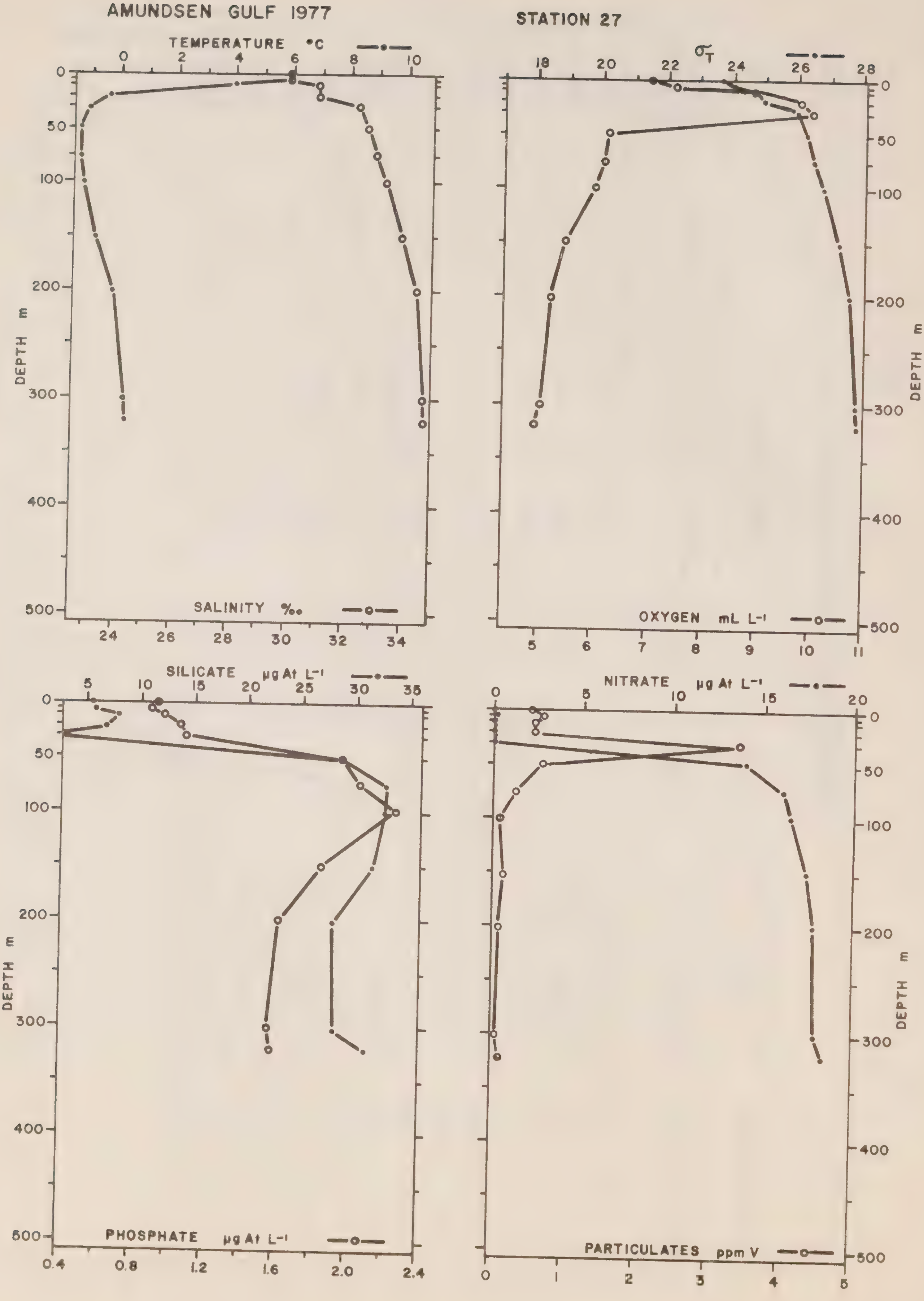


AMUNDSEN GULF 1977
STATION 26
TEMPERATURE °C
SALINITY ‰
DEPTH m
σT
OXYGEN mL L-1
SILICATE µg At L-1
PHOSPHATE µg At L-1
NITRATE µg At L-1
PARTICULATES ppm V

AMUNDSEN GULF CHEMICAL DATA 1977

STATION 026 21/8/77 2313 GMT DEPTH 370 m

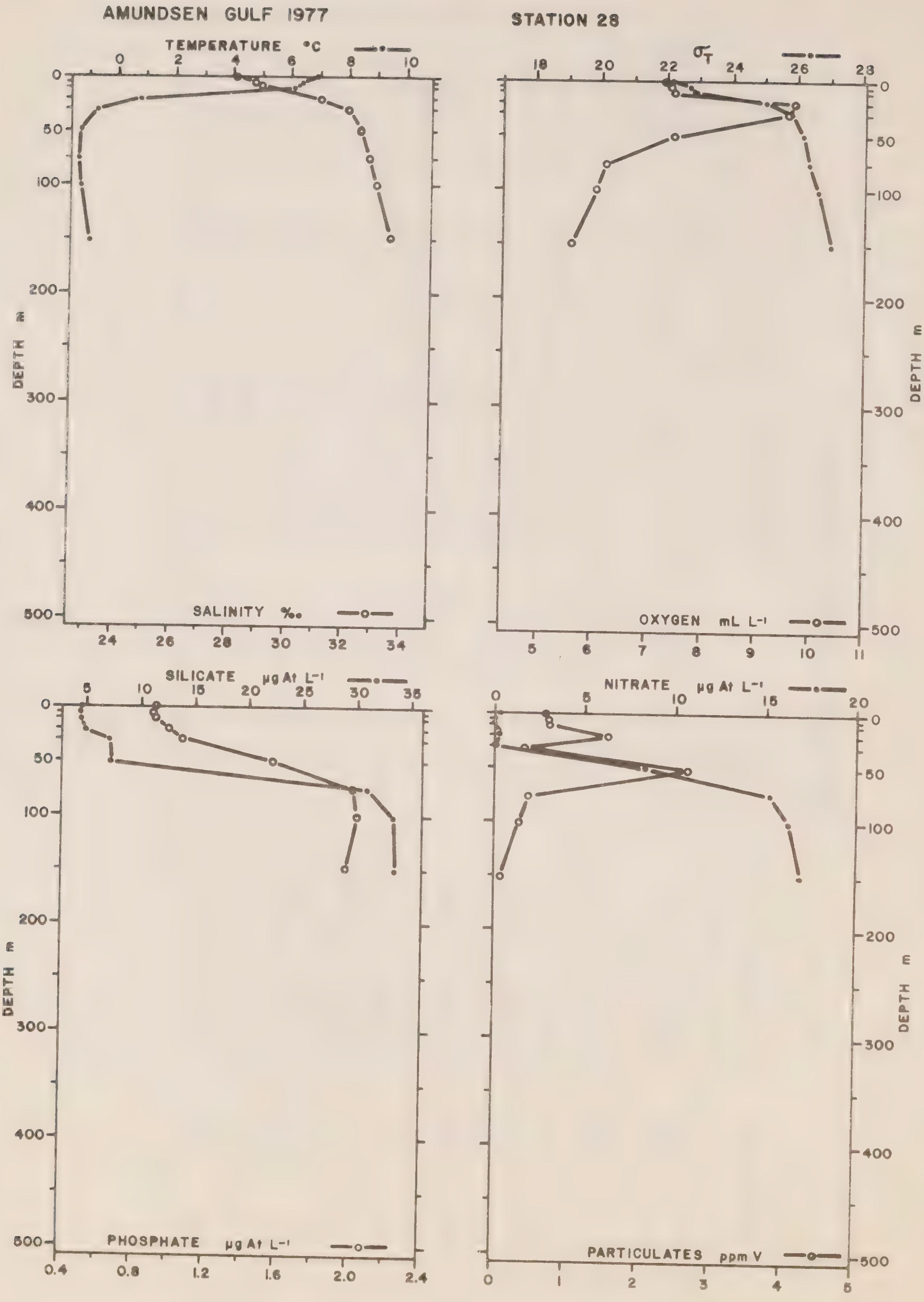
DEPTH (m)	TEMP. (^{o}C)	SALINITY (^{o}/oo)	σ_T	OXYGEN (mL L^{-1})	OXYGEN % SAT'N	PHOSPHATE (μg at L^{-1})	SILICATE (μg at L^{-1})	NITRATE (μg at L^{-1})	SUSPENDED PARTICLES (ppmV)
0	9.17	28.575	22.10	-	-	0.89	5.9	0	0.378
5	8.97	28.629	22.17	-	-	0.88	5.5	0	0.375
10	2.67	30.387	24.26	-	-	0.94	5.3	0	0.438
20	-0.53	31.576	25.39	-	-	1.01	5.5	0	0.222
30	-0.79	32.041	25.77	-	-	1.09	6.6	0	0.548
50	-1.44	32.624	26.26	-	-	1.94	26.6	12.4	0.236
75	-1.44	32.976	26.54	-	-	2.02	32.3	14.8	0.108
100	-1.38	33.171	26.70	-	-	2.04	33.5	15.1	0.088
150	-1.12	33.585	27.03	-	-	1.95	33.0	15.4	0.080
200	-0.39	34.334	27.61	-	-	1.63	27.4	15.9	0.057
300	0.18	34.756	27.92	-	-	1.38	21.9	15.3	0.091
350	0.21	34.787	27.95	-	-	1.36	21.4	15.0	0.068


AMUNDSEN GULF 1977
STATION 27
TEMPERATURE °C
SALINITY ‰
DEPTH m
σT
OXYGEN mL L-1
SILICATE µg At L-1
PHOSPHATE µg At L-1
NITRATE µg At L-1
PARTICULATES ppm V

AMUNDSEN GULF CHEMICAL DATA 1977

STATION 027 29/8/77 1651 GMT DEPTH 337 m

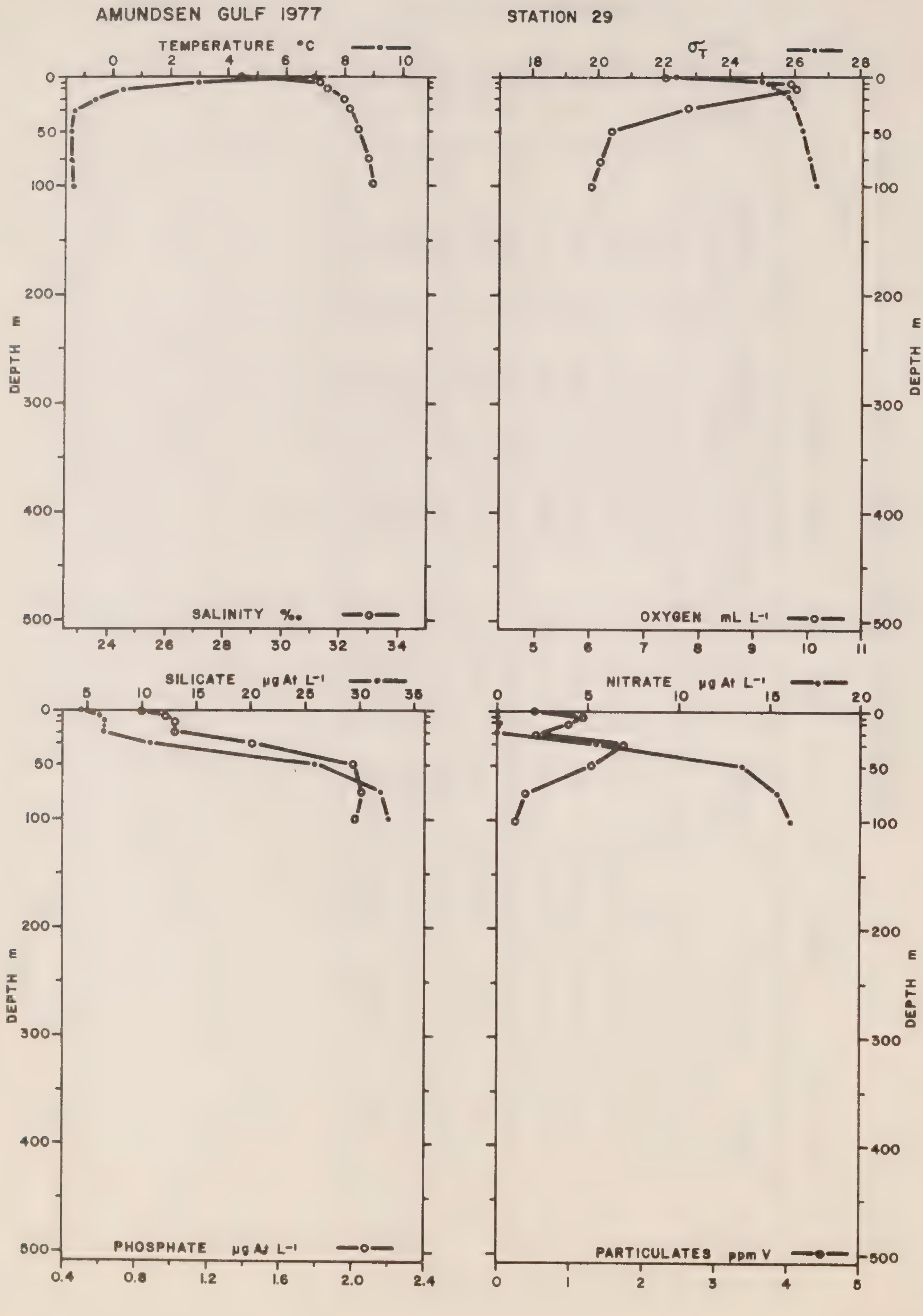
DEPTH (m)	TEMP. (^{o}C)	SALINITY (^{o}/oo)	σ_T	OXYGEN (mL L^{-1})	OXYGEN % SAT'N	PHOSPHATE (µg at L^{-1})	SILICATE (µg at L^{-1})	NITRATE (µg at L^{-1})	SUSPENDED PARTICLES (ppmV)
0	5.91	29.945	23.60	7.028	98.0	0.93	5.3	0	0.496
5	5.89	29.960	23.89	7.499	104.5	0.89	5.7	0.1	0.638
10	4.01	30.976	24.62	8.951	120.0	0.97	7.8	0	0.566
20	-0.38	31.012	24.93	9.780	117.1	1.05	6.7	0	-
30	-1.01	32.361	26.04	10.074	119.7	1.08	2.0	0	3.39
50	-1.42	32.728	26.34	6.267	73.8	1.96	28.6	13.9	0.681
75	-1.40	32.997	26.56	6.136	72.4	2.06	32.7	15.9	0.262
100	-1.26	33.301	26.80	5.982	71.1	2.26	32.7	16.3	0.104
150	-0.80	33.945	27.32	5.458	65.9	1.84	31.5	17.3	0.108
200	-0.23	34.439	27.69	5.180	63.8	1.62	27.8	17.9	0.072
300	0.17	34.741	27.89	5.001	62.3	1.56	28.1	17.9	0.075
320	0.19	34.754	27.92	4.888	61.0	1.57	30.9	18.3	0.133


AMUNDSEN GULF 1977
STATION 28
TEMPERATURE °C
SALINITY ‰
DEPTH m
σ_T
OXYGEN mL L⁻¹
SILICATE µg At L⁻¹
PHOSPHATE µg At L⁻¹
NITRATE µg At L⁻¹
PARTICULATES ppm V

AMUNDSEN GULF CHEMICAL DATA 1977

STATION 028   29.8/77   2212 GMT   DEPTH 168 m

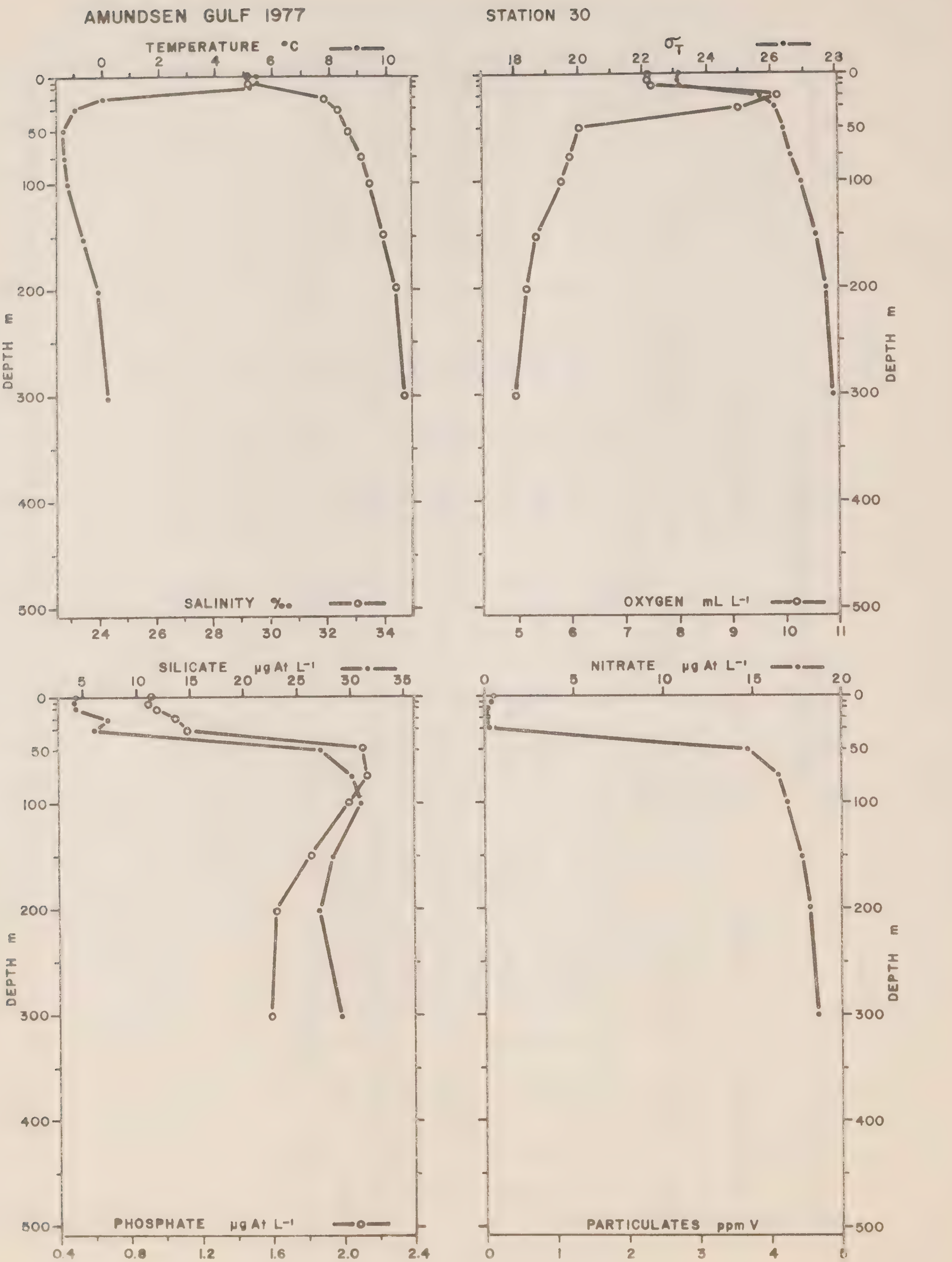
DEPTH (m)	TEMP. (^{o}C)	SALINITY (^{o}/oo)	σ_T	OXYGEN (mL L^{-1})	OXYGEN % SAT'N	PHOSPHATE (μg at L^{-1})	SILICATE (μg at L^{-1})	NITRATE (μg at L^{-1})	SUSPENDED PARTICLES (ppmV)
0	6.89	28.189	22.11	7.314	103.2	0.91	4.4	0.2	0.633
5	6.38	28.859	22.69	7.406	103.7	0.89	4.4	0	0.736
10	6.15	29.087	22.90	7.467	104.2	0.91	4.4	0	0.692
20	0.77	31.203	25.04	9.702	119.9	0.98	4.9	0.1	1.47
30	-0.68	32.121	25.83	9.550	114.3	1.06	7.2	0	0.394
50	-1.33	32.527	26.18	7.460	88.0	1.57	7.3	8.3	2.64
75	-1.41	32.856	26.44	6.206	73.2	2.02	31.1	15.1	0.377
100	-1.31	33.148	26.68	6.043	71.6	2.04	33.3	16.3	0.272
150	-1.00	33.650	27.08	5.603	66.4	1.96	33.3	17.0	0.090


AMUNDSEN GULF 1977
STATION 29
TEMPERATURE °C
SALINITY ‰
DEPTH m
σT
OXYGEN mL L⁻¹
SILICATE µg At L⁻¹
PHOSPHATE µg At L⁻¹
NITRATE µg At L⁻¹
PARTICULATES ppm V

AMUNDSEN GULF CHEMICAL DATA 1977

STATION 029 30/8/77 0158 GMT DEPTH 120 m

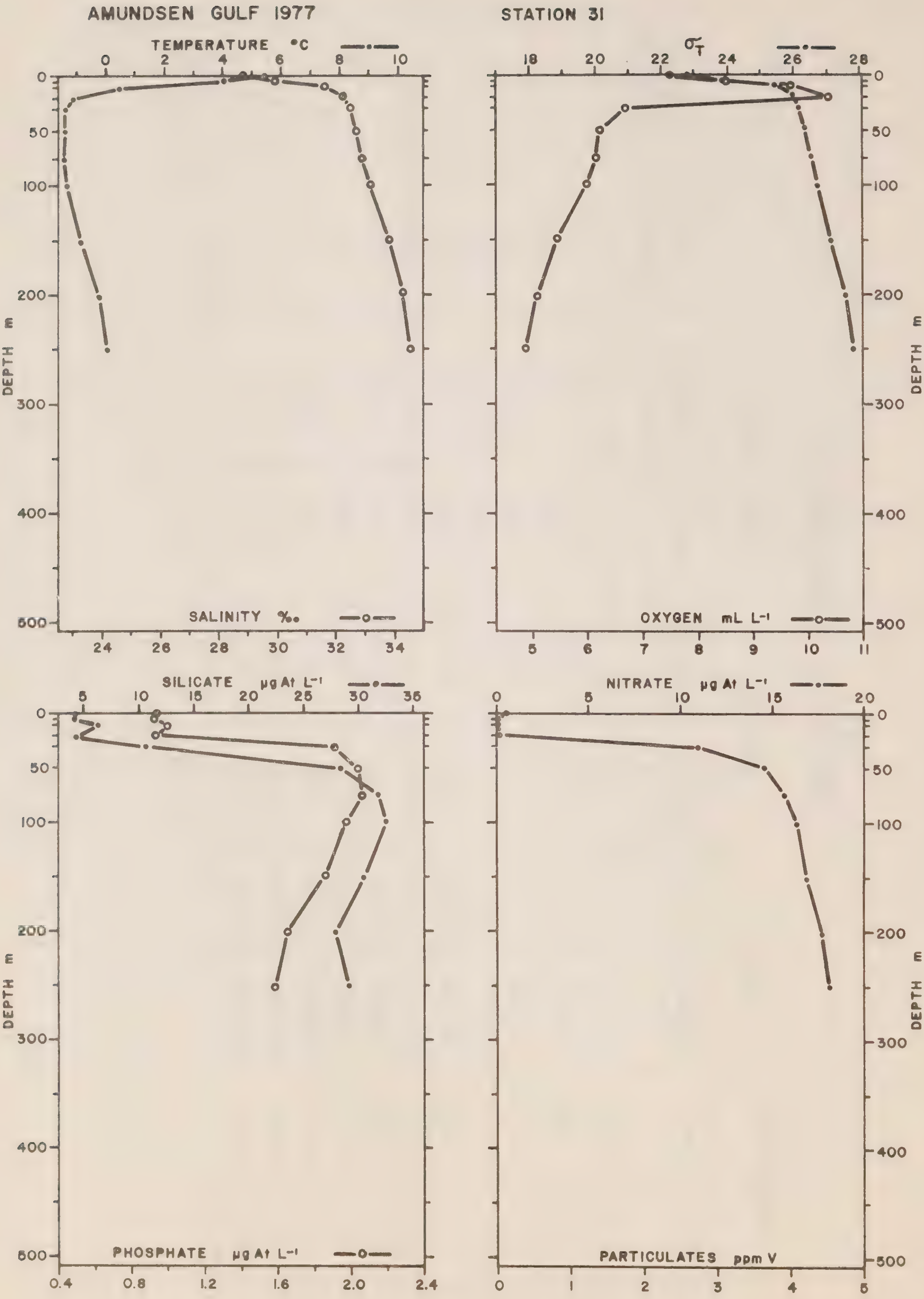
DEPTH (m)	TEMP. (^{o}C)	SALINITY (^{o}/oo)	σ_T	OXYGEN (mL L^{-1})	OXYGEN % SAT'N	PHOSPHATE (μg at L^{-1})	SILICATE (μg at L^{-1})	NITRATE (μg at L^{-1})	SUSPENDED PARTICLES (ppmV)
0	6.97	28.550	22.38	7.337	104.0	0.84	4.5	0	0.501
5	3.00	31.354	25.01	9.696	127.1	0.97	6.3	0	1.12
10	0.65	31.607	25.37	9.808	121.2	1.02	6.8	0.1	0.881
20	-0.58	32.076	25.80	9.668	116.0	1.02	6.7	0	0.535
30	-1.31	32.338	26.02	7.822	92.2	1.45	11.0	5.4	1.75
50	-1.39	32.650	26.28	6.389	75.3	2.01	26.0	13.5	1.31
75	-1.39	32.917	26.49	6.200	73.2	2.06	31.9	15.4	0.358
100	-1.32	33.137	26.67	6.027	71.4	2.03	32.7	16.2	0.250


AMUNDSEN GULF 1977
STATION 30
TEMPERATURE °C
0 2 4 6 8 10
SALINITY ‰
24 26 28 30 32 34
DEPTH m
0 50 100 200 300 400 500
σ_T
18 20 22 24 26 28
OXYGEN mL L⁻¹
5 6 7 8 9 10 11
SILICATE µg At L⁻¹
5 10 15 20 25 30 35
PHOSPHATE µg At L⁻¹
0.4 0.8 1.2 1.6 2.0 2.4
NITRATE µg At L⁻¹
0 5 10 15 20
PARTICULATES ppm V
0 1 2 3 4 5

AMUNDSEN GULF CHEMICAL DATA 1977

STATION 030 6/9/77 1731 GMT DEPTH 321 m

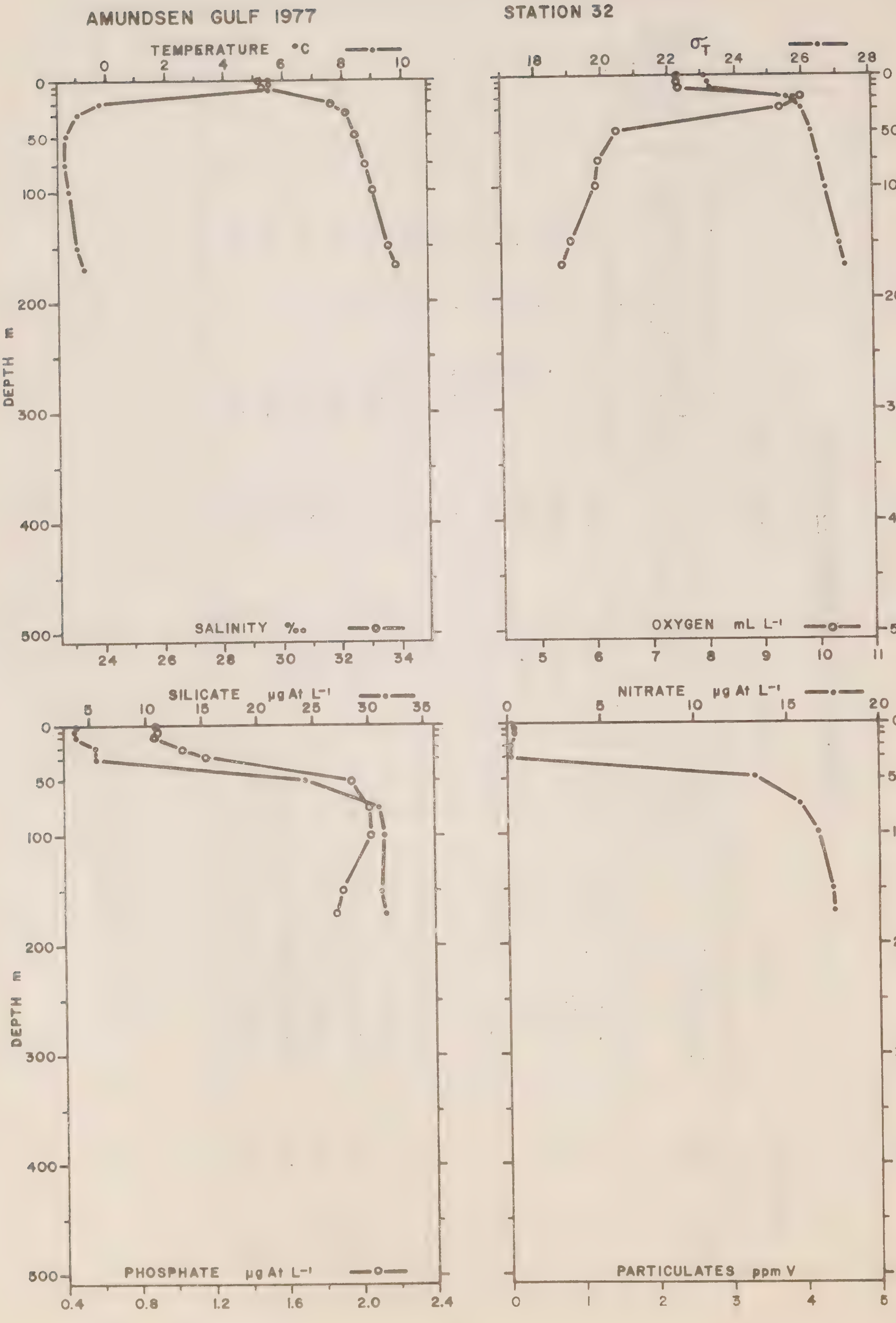
DEPTH (m)	TEMP. (^{o}C)	SALINITY (^{o}/oo)	σ_T	OXYGEN (mL L^{-1})	OXYGEN % SAT'N	PHOSPHATE (µg at L^{-1})	SILICATE (µg at L^{-1})	NITRATE (µg at L^{-1})	SUSPENDED PARTICLES (ppmV)
0	5.53	29.319	23.15	7.457	102.6	0.93	4.4	0.4	-
5	5.55	29.323	23.15	7.456	102.7	0.90	4.3	0.3	-
10	5.30	29.344	23.20	7.501	102.7	0.95	4.4	0.1	-
20	0.05	31.973	25.69	9.886	120.5	1.06	7.4	0.1	-
30	-0.96	32.451	26.11	9.152	108.9	1.12	6.2	0.2	-
50	-1.39	32.836	26.43	6.182	72.9	2.12	27.2	14.8	-
75	-1.30	33.152	26.68	5.975	70.8	2.15	30.2	16.5	-
100	-1.15	33.473	26.94	5.790	69.1	2.04	31.0	17.0	-
150	-0.67	34.065	27.40	5.298	64.3	1.82	28.5	17.8	-
200	-0.16	34.503	27.74	5.155	64.1	1.62	27.0	18.3	-
300	0.18	34.750	27.92	4.915	61.3	1.59	29.2	18.7	-


AMUNDSEN GULF 1977
STATION 31
TEMPERATURE °C
SALINITY ‰
σT
OXYGEN mL L⁻¹
SILICATE µg At L⁻¹
PHOSPHATE µg At L⁻¹
NITRATE µg At L⁻¹
PARTICULATES ppm V
DEPTH m

AMUNDSEN GULF CHEMICAL DATA 1977

STATION 031 6/9/77 2052 GMT DEPTH 270 m

DEPTH (m)	TEMP. (^{o}C)	SALINITY (^{o}/oo)	σ_T	OXYGEN (mL L^{-1})	OXYGEN % SAT'N	PHOSPHATE (µg at L^{-1})	SILICATE (µg at L^{-1})	NITRATE (µg at L^{-1})	SUSPENDED PARTICLES (ppmV)
0	5.52	28.943	22.86	7.484	102.7	0.94	4.2	0.5	-
5	4.04	30.082	23.90	8.468	113.0	0.92	4.1	0.1	-
10	0.52	31.716	25.46	9.741	120.0	0.99	6.2	0.1	-
20	-1.06	32.384	26.06	10.385	123.2	0.93	4.3	0.1	-
30	-1.37	32.564	26.21	6.734	79.3	1.91	10.5	11.0	-
50	-1.41	32.760	26.37	6.238	73.5	2.04	28.5	14.5	-
75	-1.41	33.006	26.57	6.175	73.0	2.06	31.8	15.7	-
100	-1.29	33.278	26.78	6.001	71.2	1.98	32.6	16.3	-
150	-0.82	33.857	27.24	5.447	65.7	1.86	30.6	16.9	-
200	-0.23	34.429	27.68	5.053	62.2	1.65	27.9	17.7	-
250	0.05	34.662	27.85	4.782	59.4	1.58	29.1	18.1	-


AMUNDSEN GULF 1977
STATION 32
TEMPERATURE °C
SALINITY ‰
DEPTH m
σ_T
OXYGEN mL L⁻¹
SILICATE µg At L⁻¹
PHOSPHATE µg At L⁻¹
NITRATE µg At L⁻¹
PARTICULATES ppm V

AMUNDSEN GULF CHEMICAL DATA 1977

STATION 032 6/9/77 2340 GMT DEPTH 188 m

DEPTH (m)	TEMP. (^{o}C)	SALINITY (^{o}/oo)	σ_T	OXYGEN (mL L^{-1})	OXYGEN % SAT'N	PHOSPHATE (µg at L^{-1})	SILICATE (µg at L^{-1})	NITRATE (µg at L^{-1})	SUSPENDED PARTICLES (ppmV)
0	5.58	29.278	23.11	7.465	102.8	0.90	3.8	0.2	-
5	5.55	29.382	23.20	7.450	102.6	0.91	3.7	0.3	-
10	5.49	29.451	23.26	7.496	103.2	0.90	3.8	0.3	-
20	-0.24	31.848	25.60	9.777	118.2	1.05	5.7	0.1	-
30	-0.94	32.291	25.98	9.318	110.9	1.18	5.8	0.1	-
50	-1.38	32.631	26.26	6.390	75.3	1.96	24.4	13.4	-
75	-1.40	32.945	26.52	6.171	72.8	2.06	31.0	15.8	-
100	-1.31	33.190	26.71	6.013	71.3	2.06	31.6	16.8	-
150	-0.97	33.712	27.13	5.612	67.4	1.90	31.2	17.5	-
170	-0.81	33.892	27.27	5.402	65.2	1.86	31.7	17.7	-

TABLE 4

PRESERVED MATERIAL

IDENTIFICATION AG-77	TYPE OF SAMPLER	METHOD OF PRESERVING
14	Shipek Grab	Frozen in an Al can for hydrocarbon analysis
15	" "	" " " " "
16	" "	" " " " "
17	" "	" " " " "
19	" "	" " " " "
20	" "	" " " " "
21	" "	" " " " "
25	" "	" " " " "
26	" "	" " " " "
28	" "	" " " " "
15	Benthos Gravity Core	Frozen
17	" " "	Subsectioned and frozen
19	" " "	Frozen
20	" " "	"
22	" " "	"
23	" " "	"
24	" " "	"
25	" " "	"
26	" " "	"
27	" " "	"
28	" " "	"
29	" " "	"
30	" " "	"
31	" " "	"
NNT-1	Neuston Net Haul	5% buffered formaldehyde
NNT-2	" "	" " "
NNT-4	" "	Split; 5% CH_2O/whirl pak bag; frozen

IDENTIFICATION AG-77	TYPE OF SAMPLER	METHOD OF PRESERVING
NNT-5	Neuston NRT Haul	5% CH_2O
NNT-6	" "	"
NNT-7	" "	"
NNT-9	" "	"
NNT-12	" "	"
NNT-16	" "	Whirl pak bag; frozen
NNT-17	" "	5% CH_2O
NNT-18	" "	"
NNT-19	" "	Whirl pak bag; frozen
NNT-21	" "	" " "
NNT-22	" "	" " "
NNT-25	" "	Glass jar; frozen
NNT-27	" "	" "
MNT-1	Miller Net Haul	Whirl pak bag; frozen
MNT-2	" "	" " "
MNT-3	" "	Split; 5% CH_2O/whirl pak bag; frozen
MNT-4	" "	" " " "
MNT-5	" "	" " " "
MNT-6	" "	Not sufficient sample
MNT-7	" "	Split; 5% CH_2O/whirl pak bag; frozen
MNT-8	" "	" " " "
MNT-9	" "	Split; 5% CH_2O/Al can; whirl pak bag; frozen
MNT-10	" "	Split; 5% CH_2O/whirl pak bag; frozen
MNT-11	" "	" " " "
MNT-12	" "	Al can; frozen
MNT-13	" "	Split; 5% CH_2O/whirl pak bag; frozen
MNT-14	" "	" " " "
MNT-15	" "	" " " "
MNT-16	" "	" " " "
MNT-17	" "	Al can; frozen
MNT-18	" "	Whirl pak bag; frozen

IDENTIFICATION AG-77	TYPE OF SAMPLE	METHOD OF PRESERVING
MNT-19	Miller Net Haul	Al can; frozen
MNT-20	" "	Split; 5% CH_2O/whirl pak bag; frozen
MNT-21	" "	Split; 5% CH_2O/Al can; frozen
MNT-22	" "	Whirl pak bag; frozen
MNT-23	" "	Al can; frozen
MNT-24	" "	Split; 5% CH_2O/whirl pak bag; frozen
MNT-25	" "	Split; 5% CH_2O/Al can; frozen
MNT-26	" "	Split; 5% CH_2O/whirl pak bag; frozen
MNT-27	" "	Split; 5% CH_2O/Al can; frozen
MNT-28	" "	Split; 5% CH_2O/whirl pak bag; frozen
MNT-29	" "	" " " "
MNT-30	" "	" " " "
SCOR-1	SCOR Net	Split; 5% CH_2O/whirl pak bag; frozen

TABLE 5

WATER SAMPLES

for

MERCURY ANALYSIS

STATION NUMBERS	DEPTH METERS
14	45, 195
15	3
16	195
20	3, 45, 195
21	3
22	3, 45, 195
23	3, 45, 195
24	3, 70, 195
25	3, 70
26	3, 70, 195
27	3, 70, 195
28	3, 70
29	3, 70
30	3, 45, 250
31	3, 70, 175
32	3, 45, 70

TABLE 6
WATER SAMPLES

for

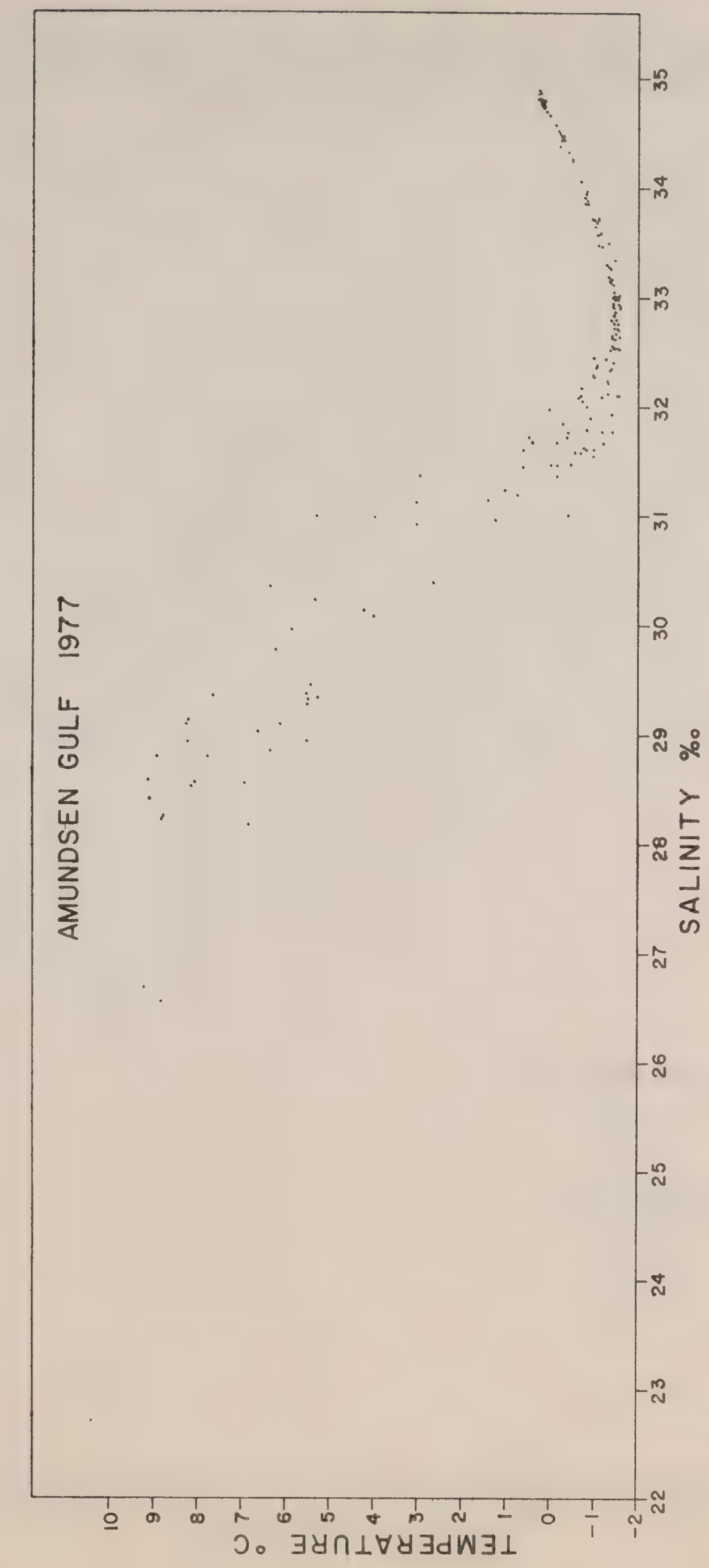
HYDROCARBON ANALYSIS

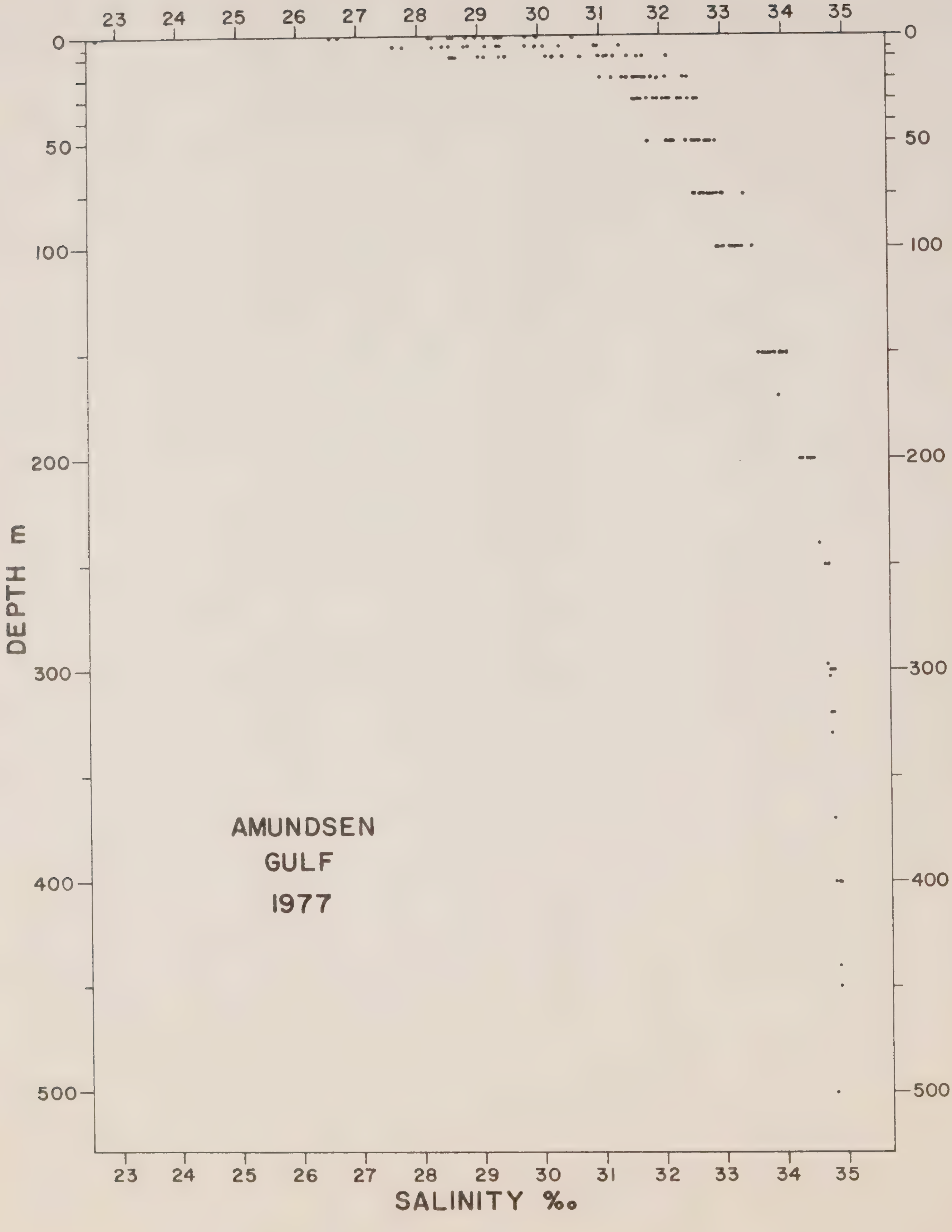
STATION NUMBER	DEPTH METERS	SAMPLER*
14	1	NBS
15	1	NBS
16	1	NBS
17	1	NBS
19	1	NBS
20	1	NBS
20	300	B
21	1	NBS
21	300	B
22	1	NBS
22	300	B
23	1	NBS
23	455	B (touched bottom)
24	1	NBS
24	400	B
25	1	NBS
25	350	B
26	1	NBS
26	350	B
27	1	NBS
27	300	B**
28	1	NBS
28	150	B
29	1	NBS
29	115	B
30	1	NBS
30	170	B
31	1	NBS
31	100	B
32	1	NBS
32	100	B

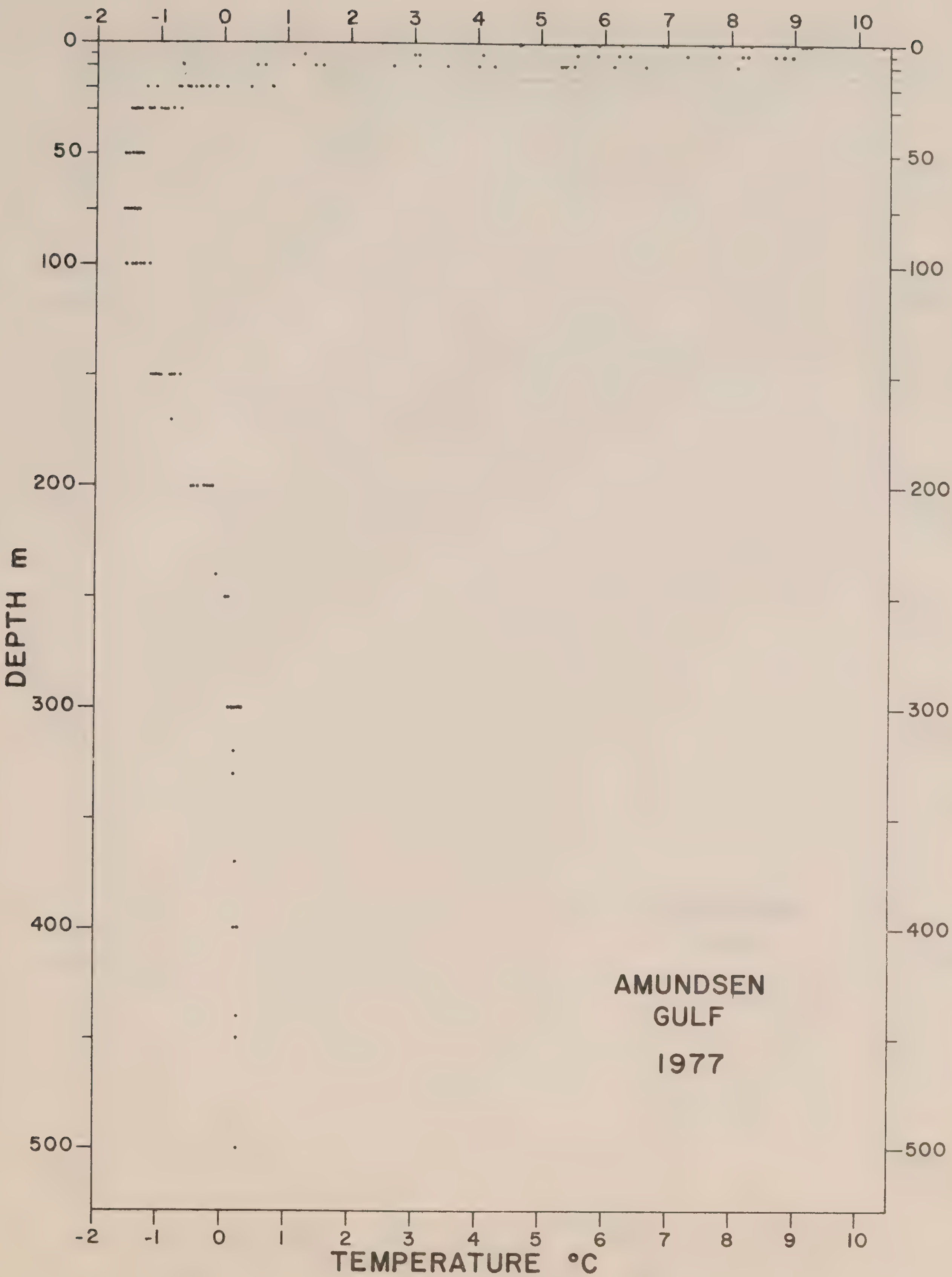
* NBS National Bureau of Standards Sampler
B Clark-Blumer Sampler

** Clark-Blumer Sampler and rupture disc assembly cleaned with CH_2Cl_2 then CH_3OH

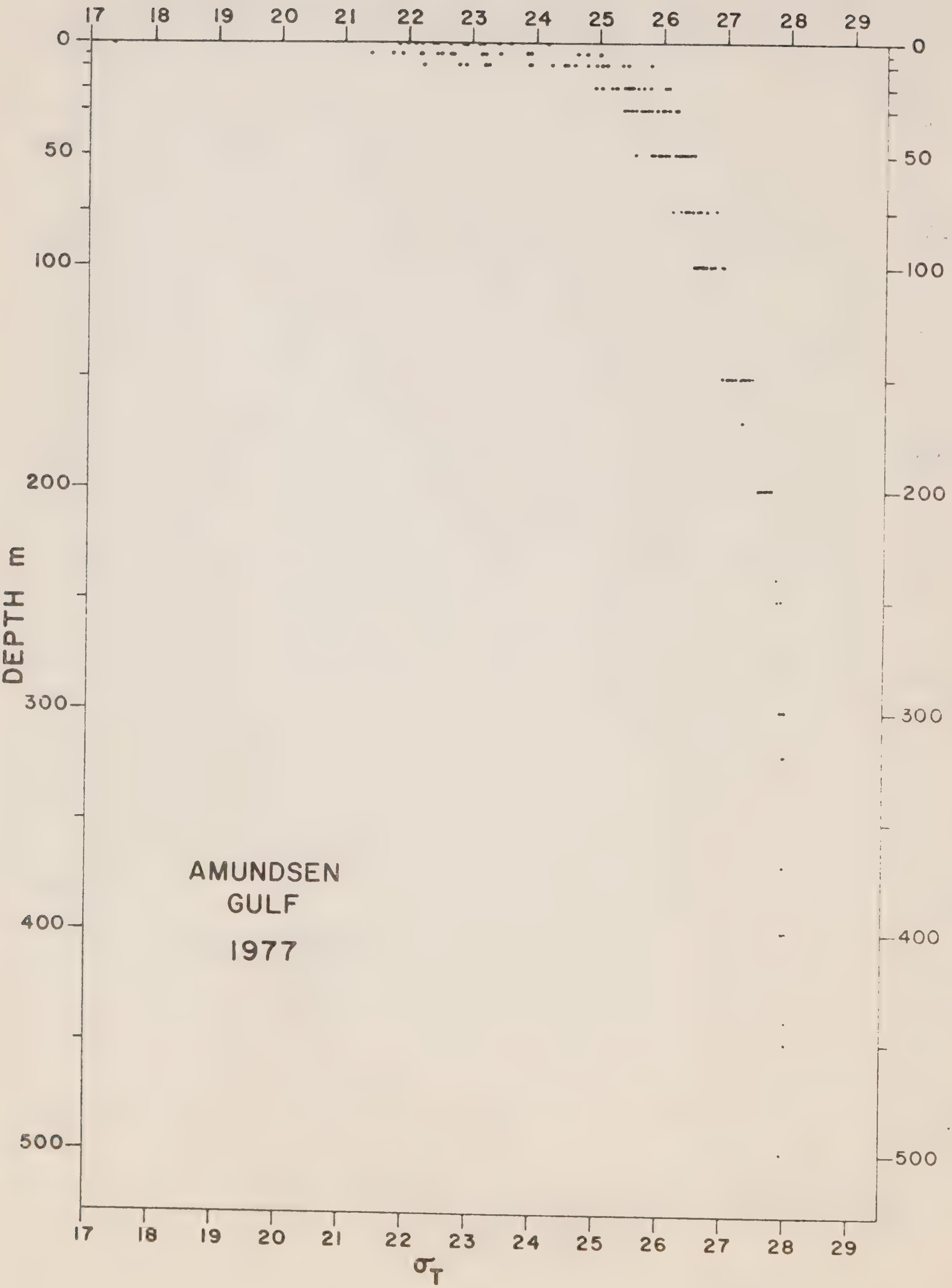
SCATTER PLOTS


AMUNDSEN GULF 1977
TEMPERATURE °C
SALINITY ‰
10
9
8
7
6
5
4
3
2
1
0
−1
−2
22
23
24
25
26
27
28
29
30
31
32
33
34
35

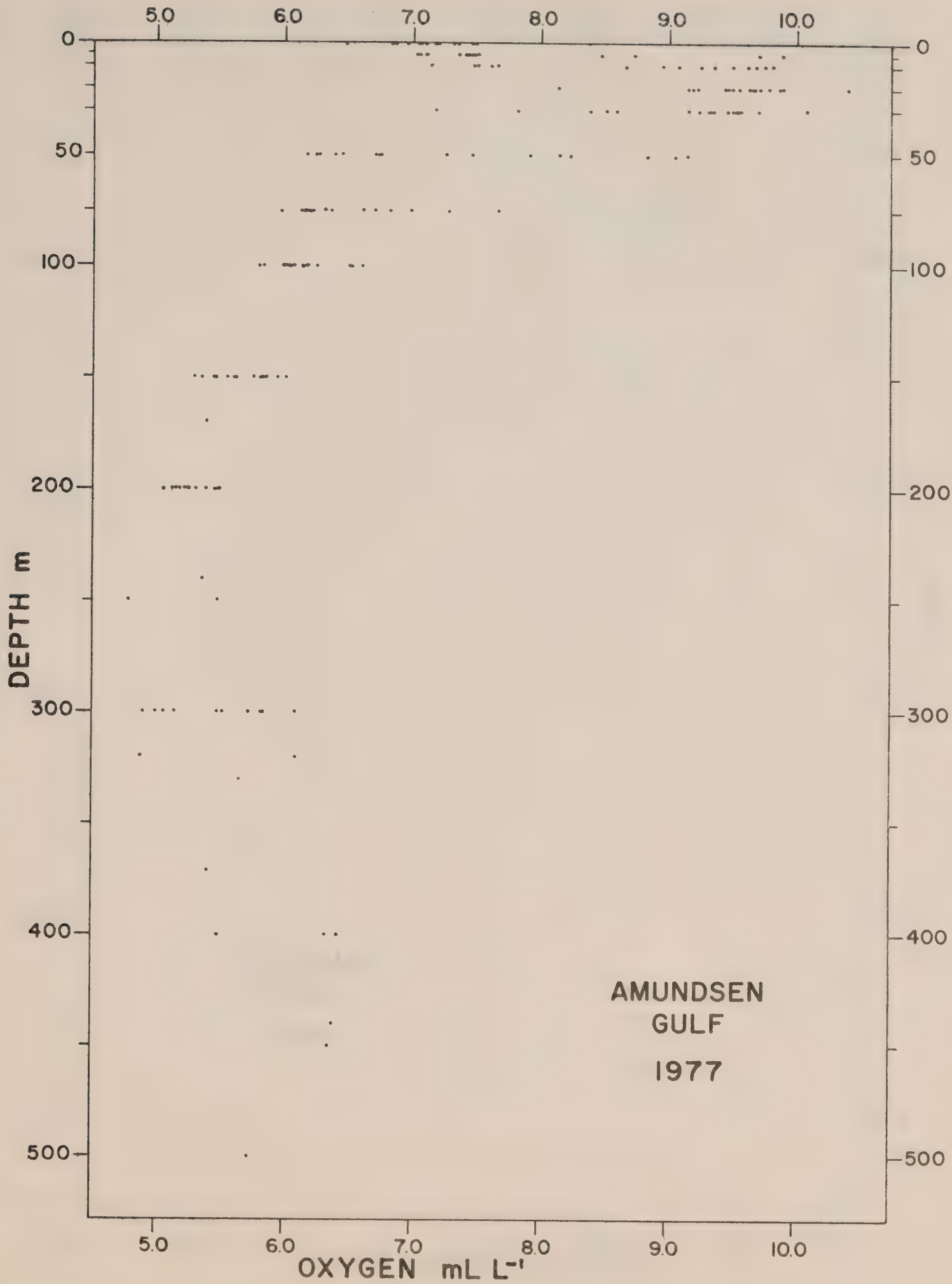

AMUNDSEN
GULF
1977
DEPTH m
SALINITY ‰
23 24 25 26 27 28 29 30 31 32 33 34 35
0 50 100 200 300 400 500



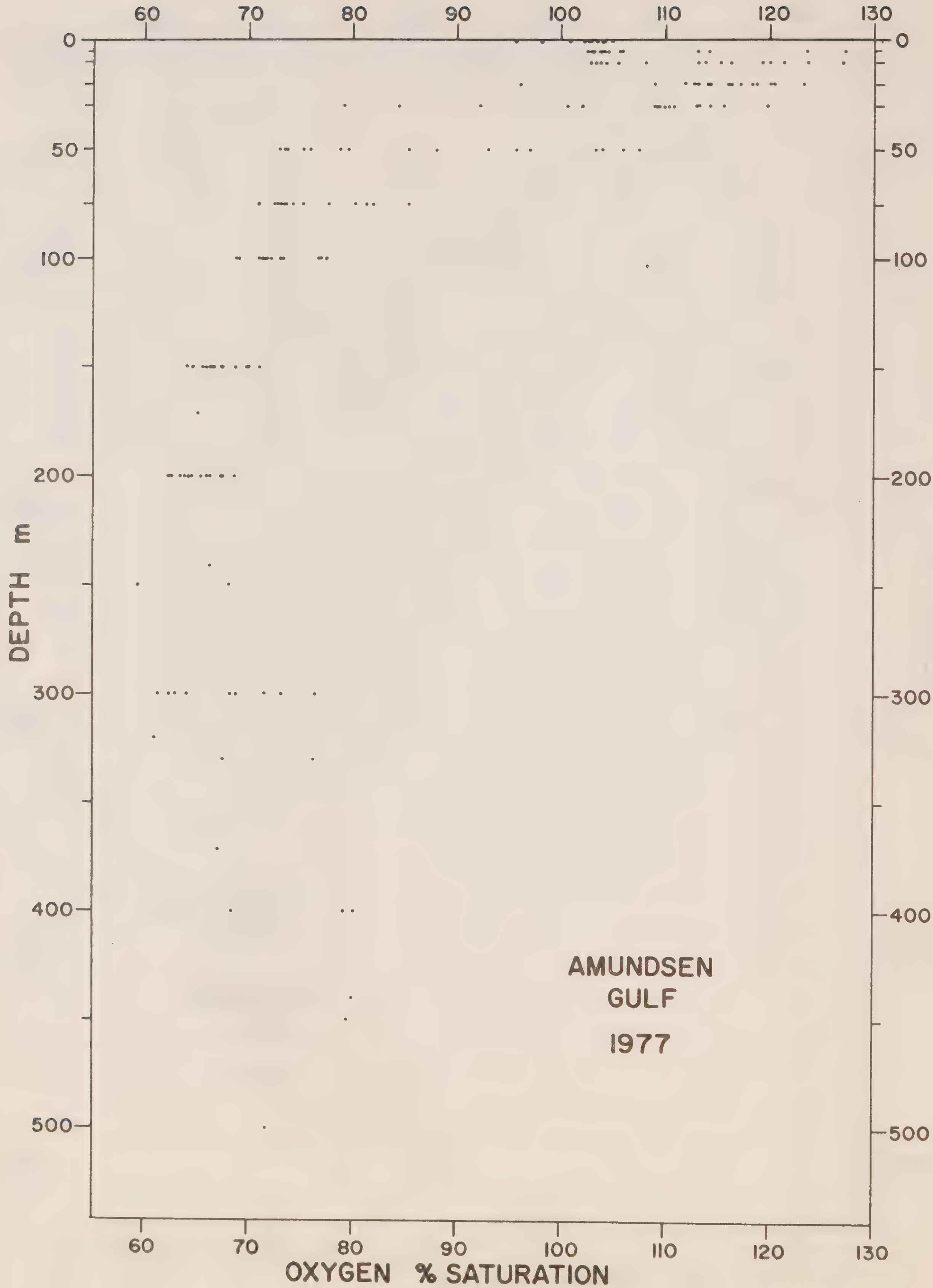
-2 -1 0 1 2 3 4 5 6 7 8 9 10
0
50
100
200
300
400
500
DEPTH m
TEMPERATURE °C
AMUNDSEN GULF
1977

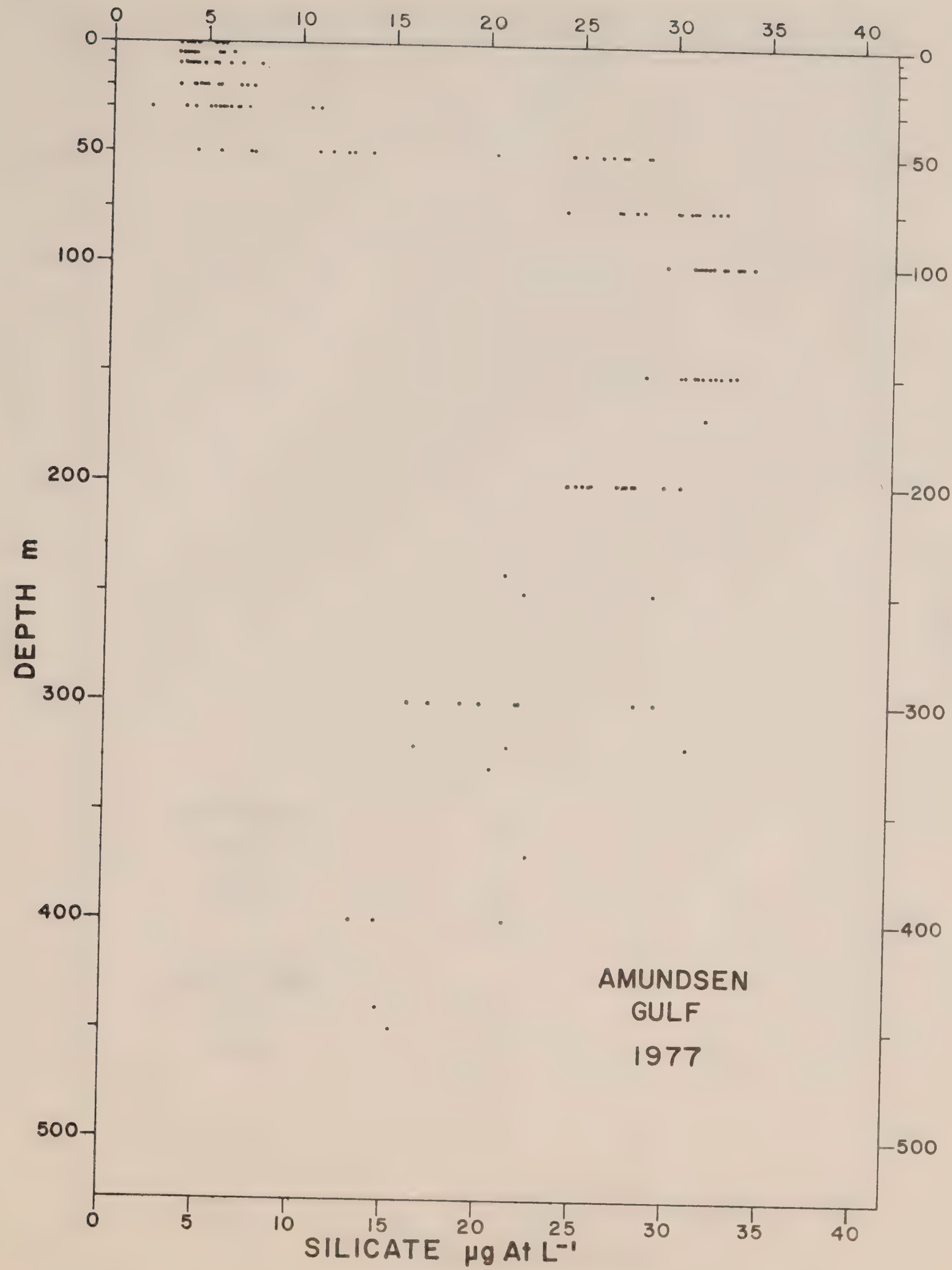


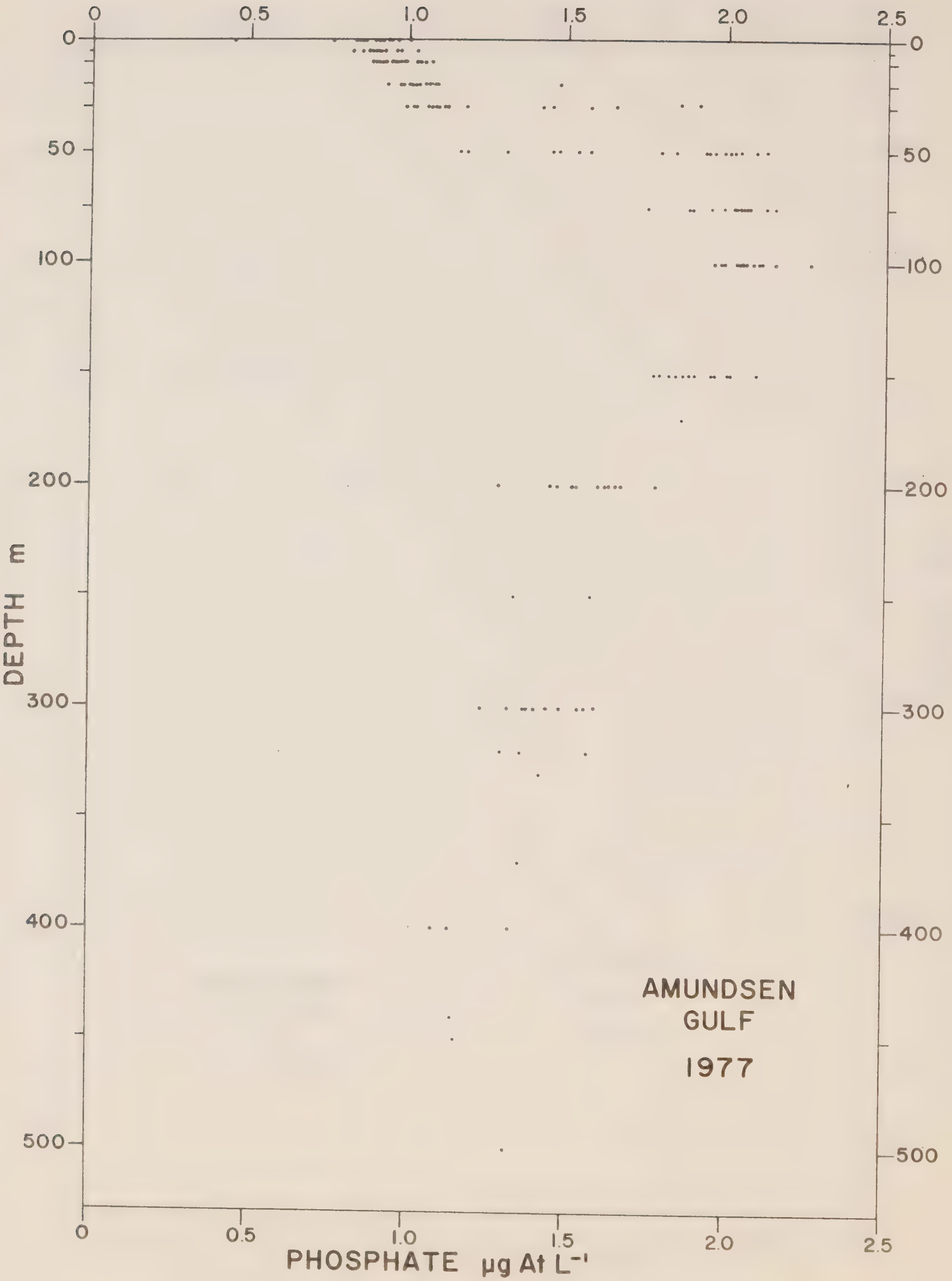
17 18 19 20 21 22 23 24 25 26 27 28 29
0
50
100
200
300
400
500
DEPTH m
AMUNDSEN
GULF
1977
σT

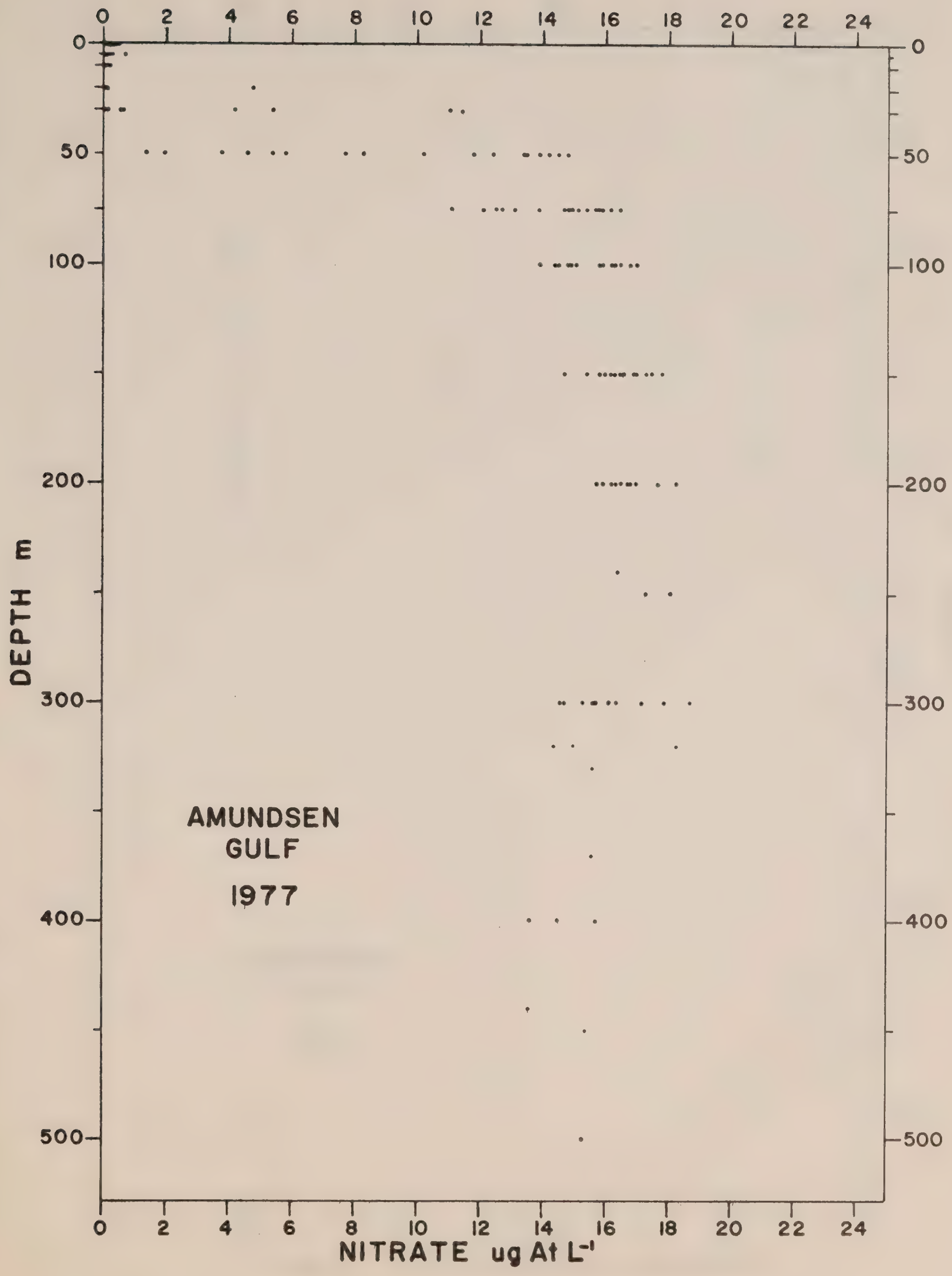


5.0
6.0
7.0
8.0
9.0
10.0
0
50
100
200
300
400
500
DEPTH m
OXYGEN mL L⁻¹
AMUNDSEN
GULF
1977

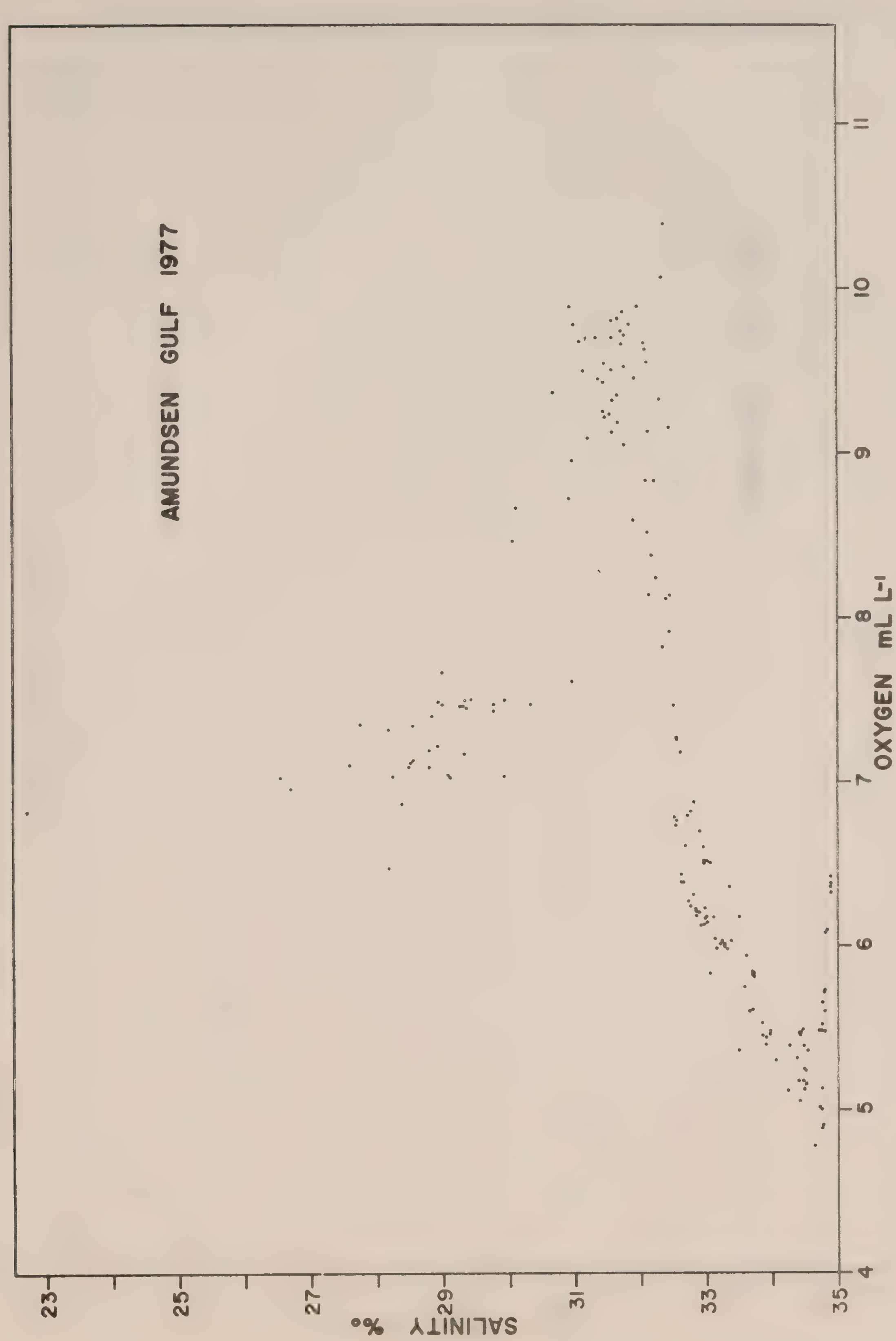

60
70
80
90
100
110
120
130
0
50
100
200
300
400
500
DEPTH m
AMUNDSEN
GULF
1977
OXYGEN % SATURATION

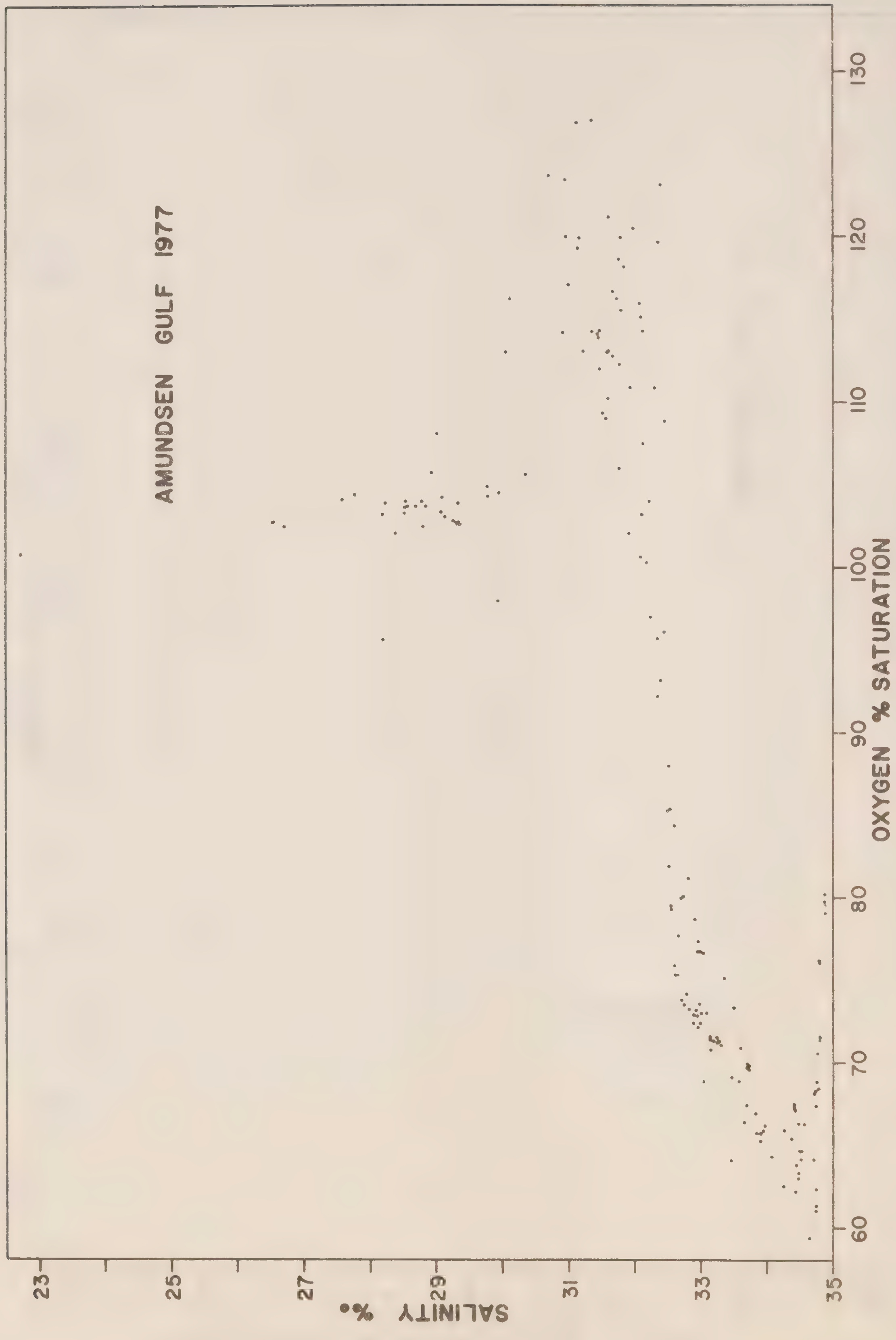

DEPTH m
SILICATE µg At L⁻¹
AMUNDSEN
GULF
1977
0 5 10 15 20 25 30 35 40
0 50 100 200 300 400 500

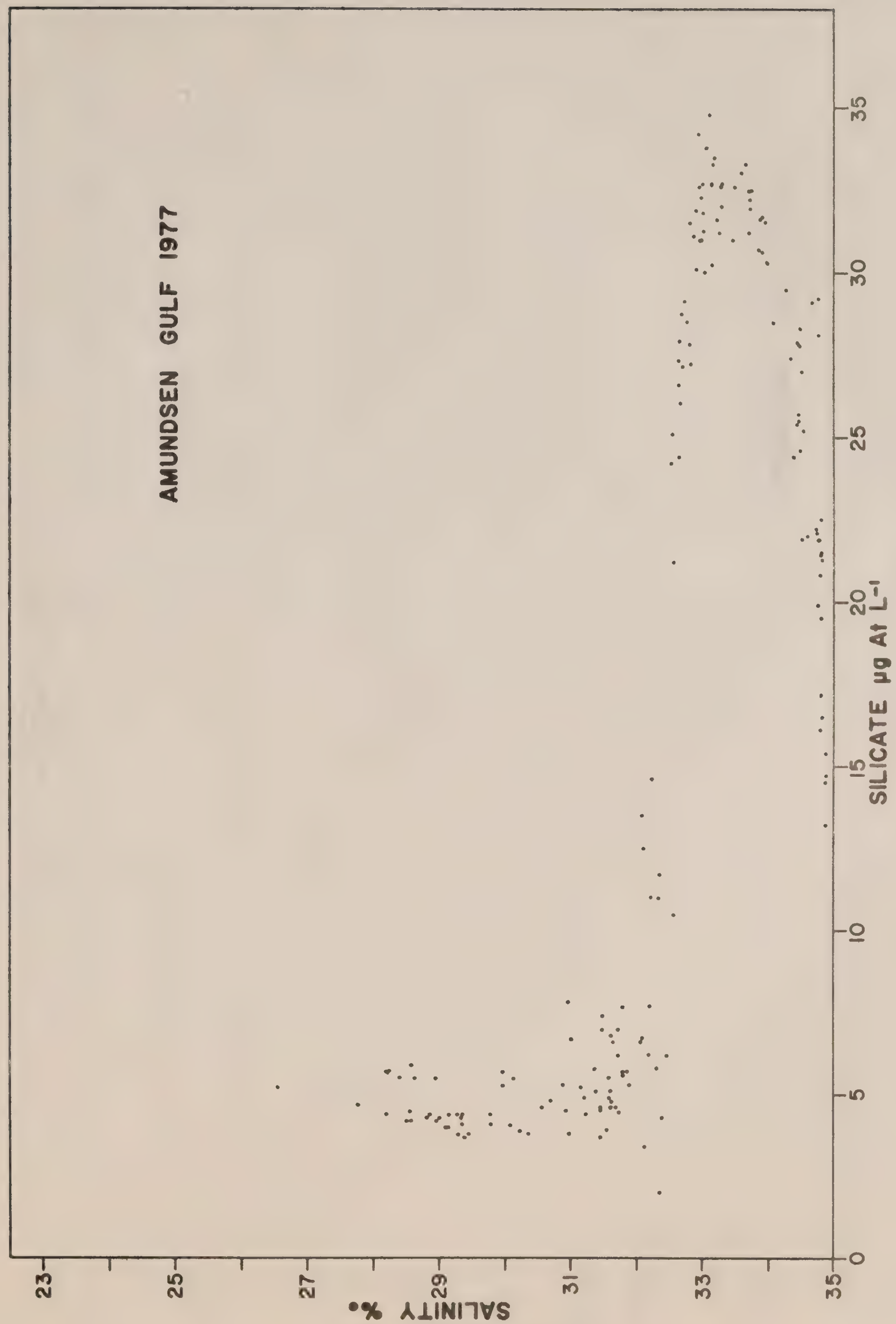

0
0.5
1.0
1.5
2.0
2.5
0
50
100
200
300
400
500
DEPTH m
AMUNDSEN
GULF
1977
PHOSPHATE µg At L⁻¹


0
2
4
6
8
10
12
14
16
18
20
22
24
0
50
100
200
300
400
500
DEPTH m
AMUNDSEN
GULF
1977
NITRATE ug At L⁻¹

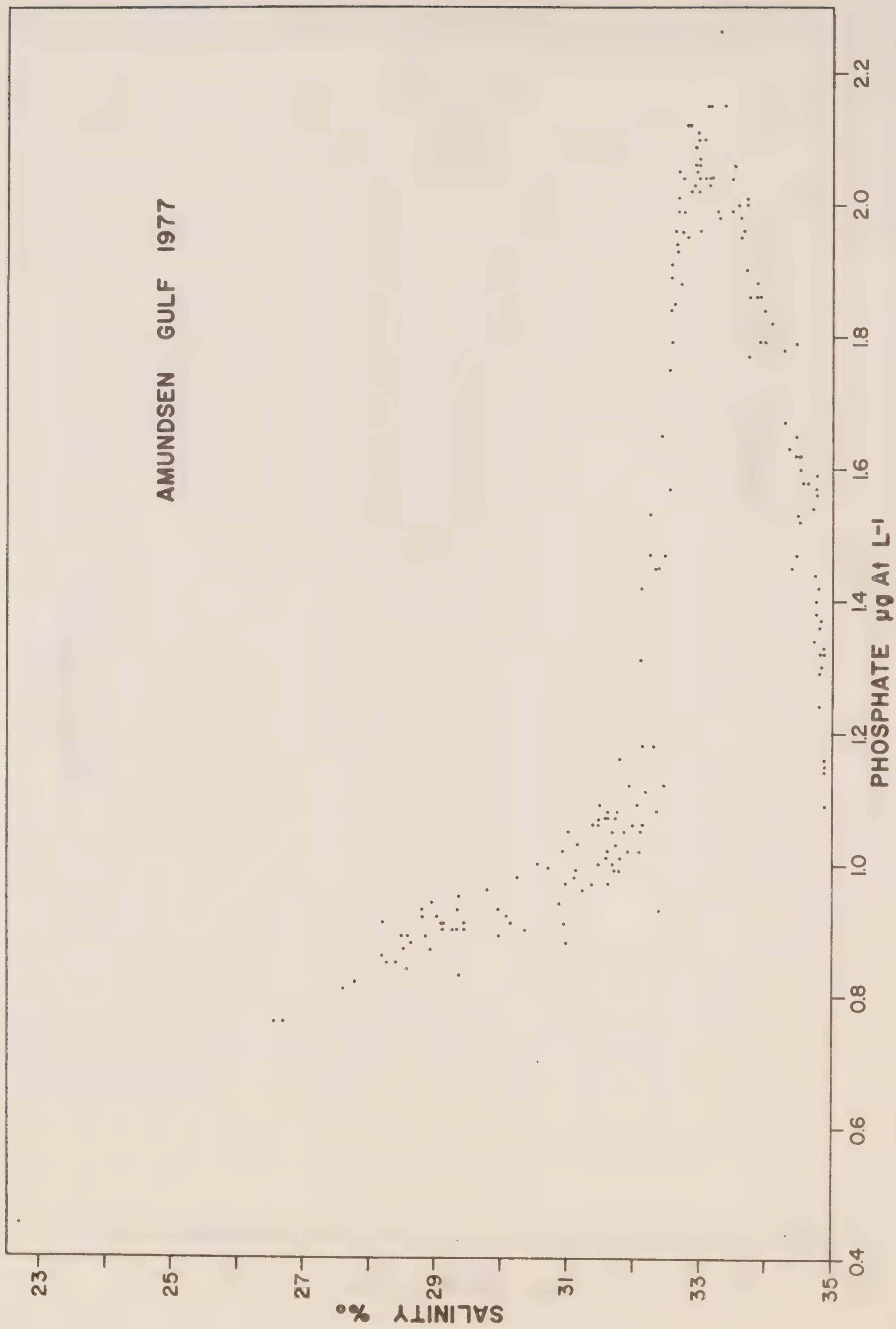

0
1.0
2.0
3.0
4.0
5.0
0
50
100
200
300
400
500
DEPTH m
AMUNDSEN
GULF
1977
SUSPENDED PARTICULATES ppm V

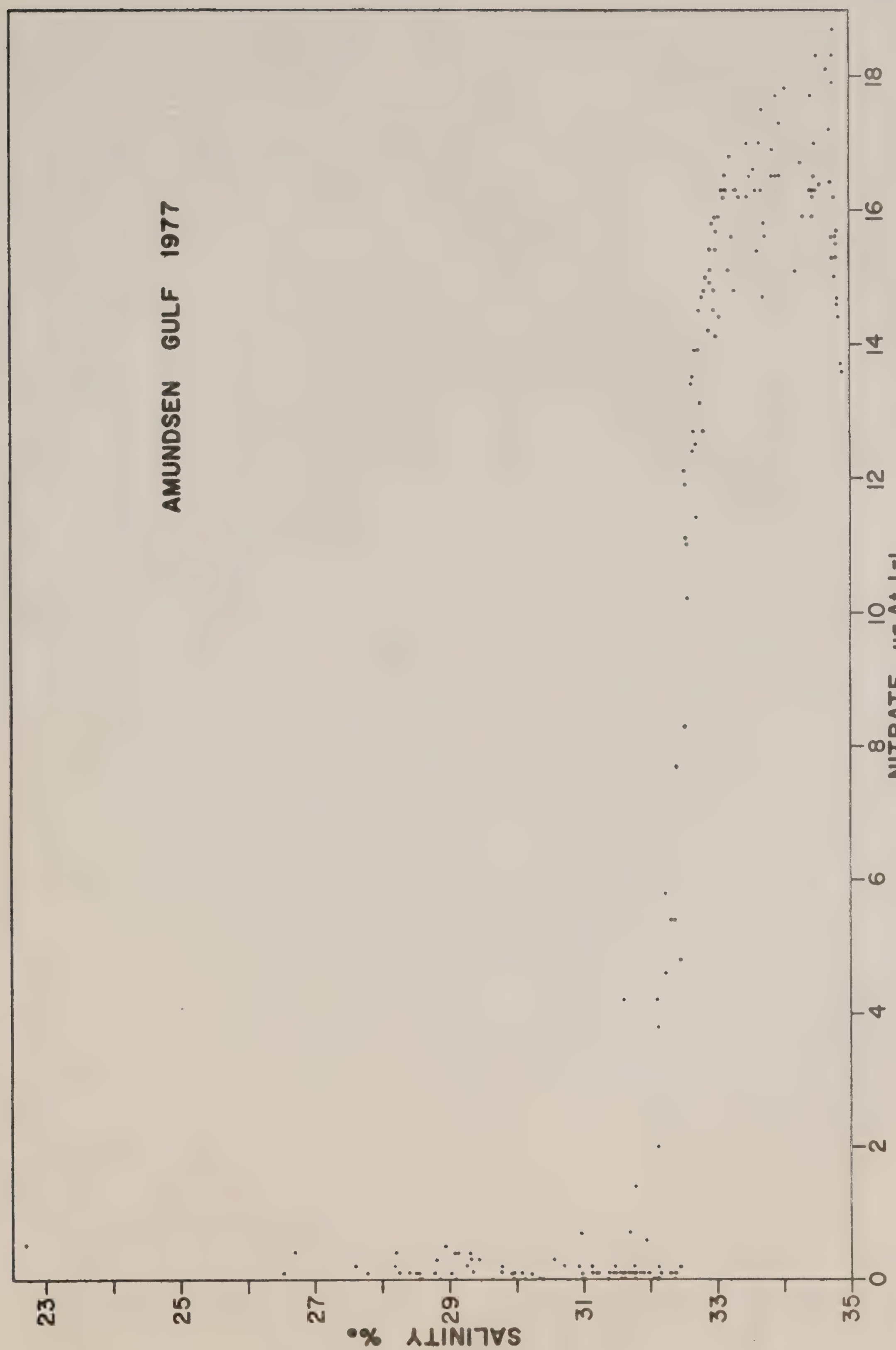

AMUNDSEN GULF 1977
OXYGEN mL L^{-1}
4
5
6
7
8
9
10
11
SALINITY ‰
23
25
27
29
31
33
35

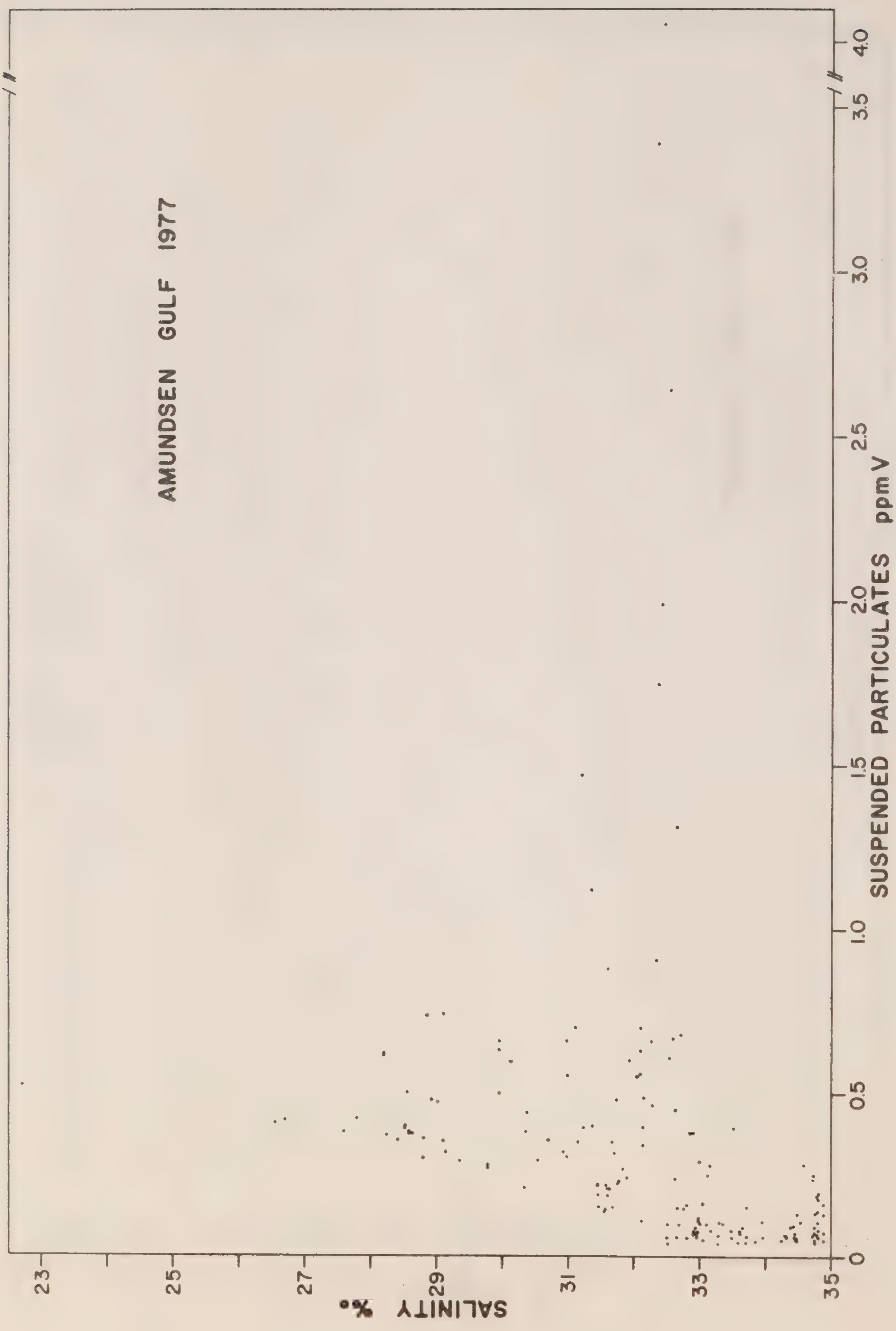

AMUNDSEN GULF 1977
OXYGEN % SATURATION
60
70
80
90
100
110
120
130
SALINITY ‰
23
25
27
29
31
33
35



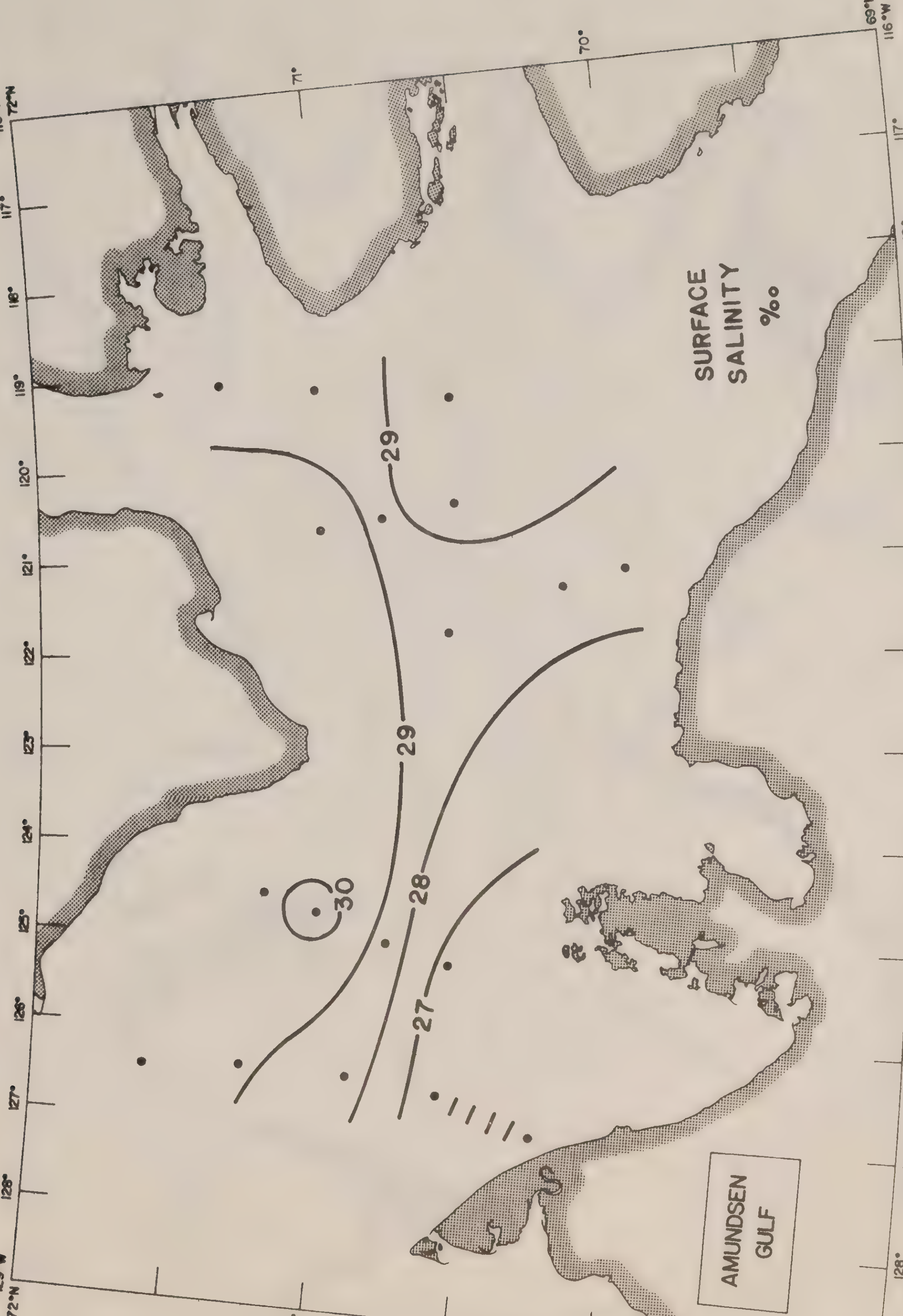
AMUNDSEN GULF 1977
SALINITY ‰
23
25
27
29
31
33
35
SILICATE µg At L⁻¹
0
5
10
15
20
25
30
35


AMUNDSEN GULF 1977
SALINITY ‰
23
25
27
29
31
33
35
PHOSPHATE μg At L⁻¹
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
2.2

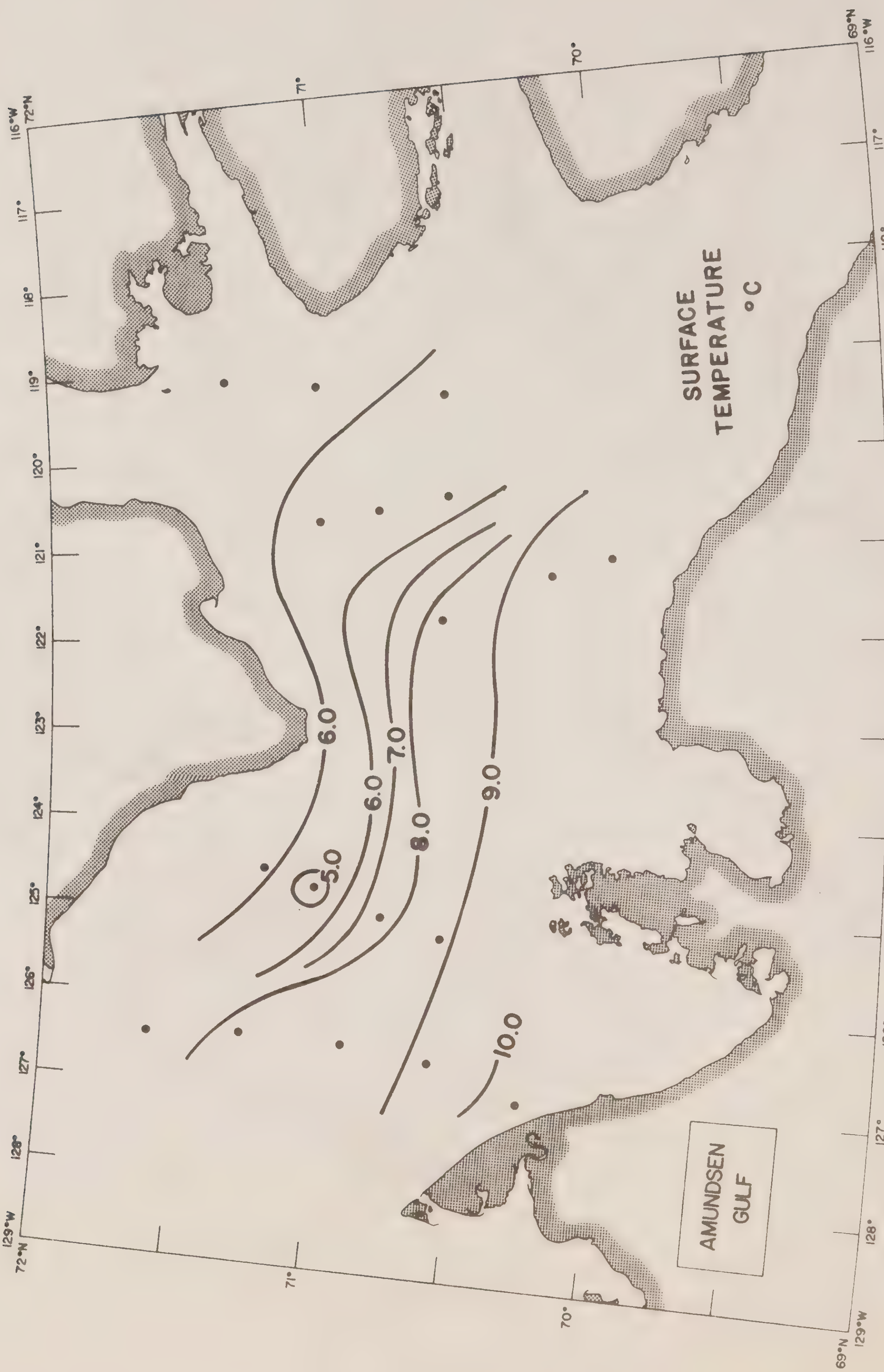

AMUNDSEN GULF 1977
SALINITY ‰
23
25
27
29
31
33
35
NITRATE $\mu g\ At\ L^{-1}$
0
2
4
6
8
10
12
14
16
18

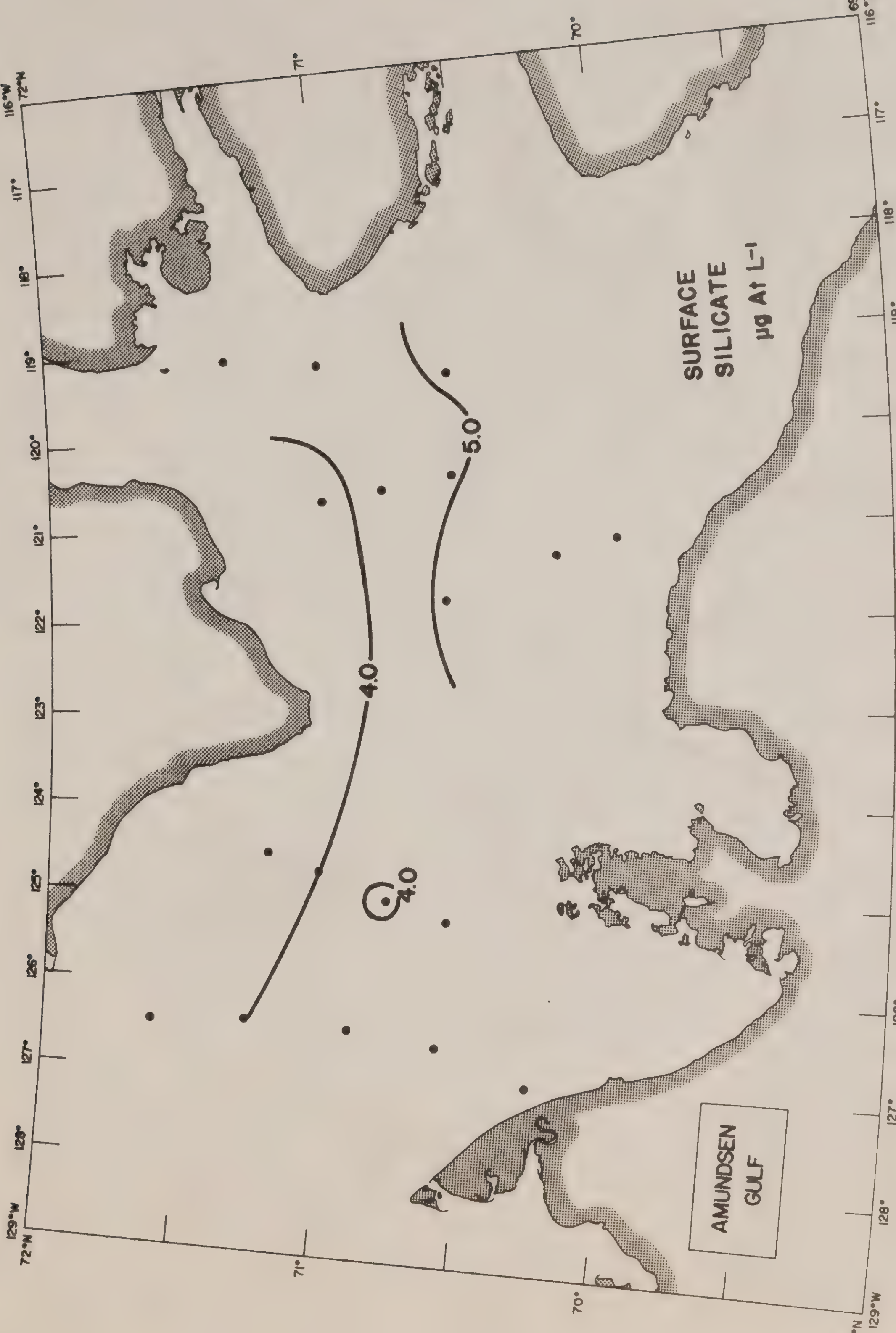

AMUNDSEN GULF 1977
SUSPENDED PARTICULATES ppmV
SALINITY ‰
0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
23
25
27
29
31
33
35

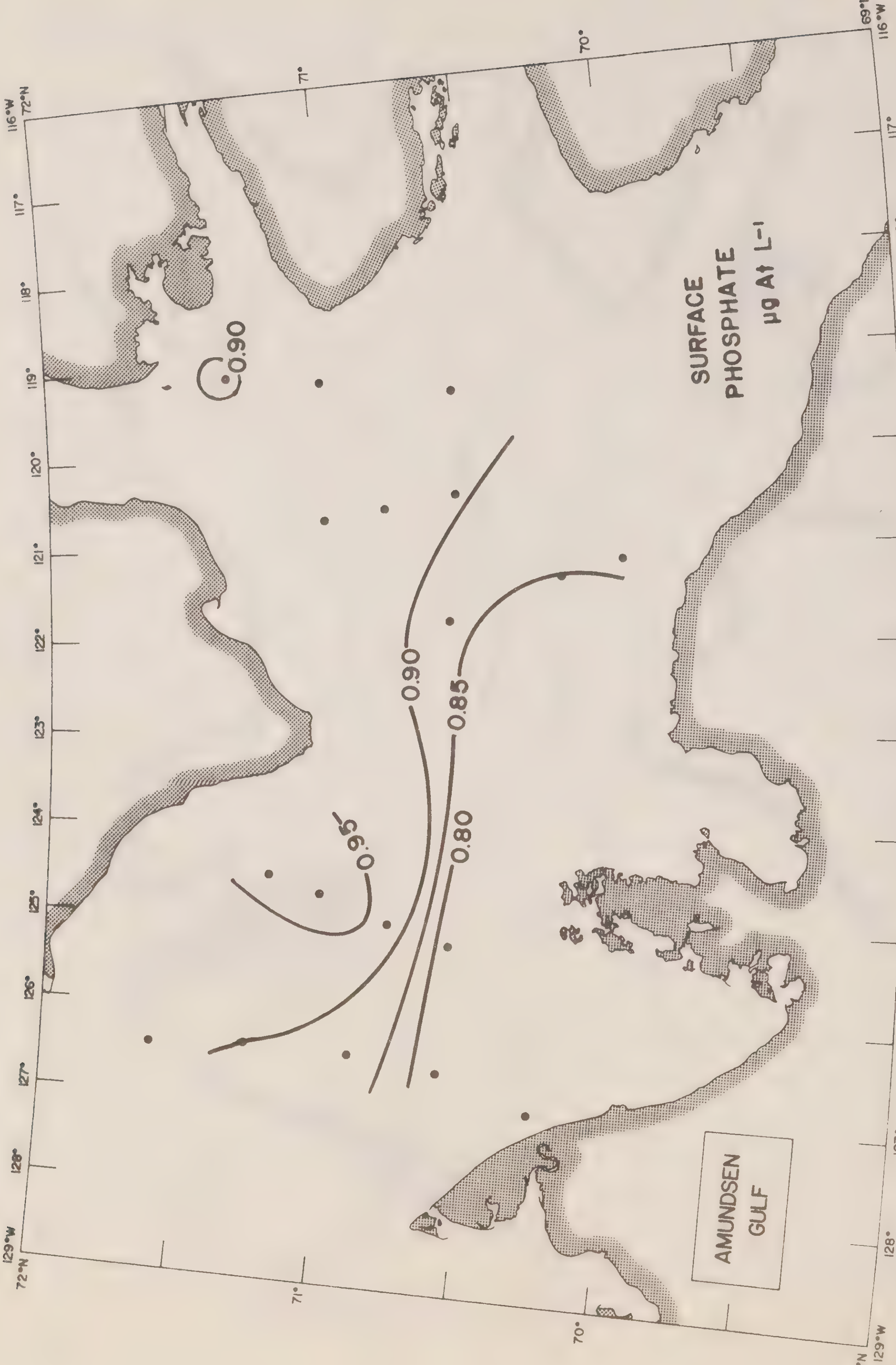
SURFACE CONTOURS



SURFACE SALINITY ‰
AMUNDSEN GULF
27
28
29
29
30
72°N 116°W
72°N 129°W
69°N 116°W
69°N 129°W
71°
70°
117°
118°
119°
120°
121°
122°
123°
124°
125°
126°
127°
128°

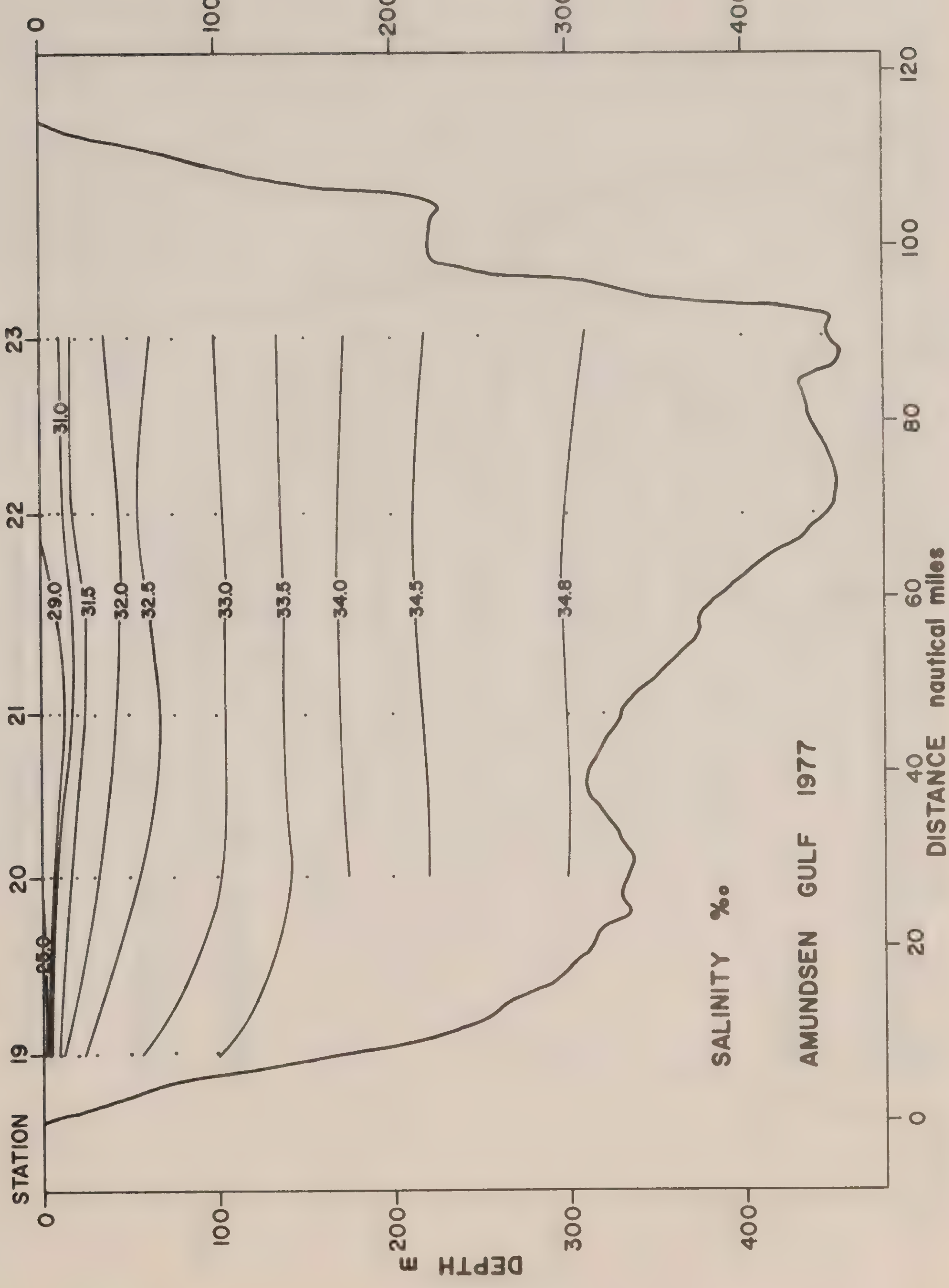

SURFACE
TEMPERATURE
°C
AMUNDSEN
GULF
5.0
6.0
6.0
7.0
8.0
9.0
10.0
72°N 116°W
69°N 116°W
72°N 129°W
69°N 129°W
71°
70°
117°
118°
119°
120°
121°
122°
123°
124°
125°
126°
127°
128°

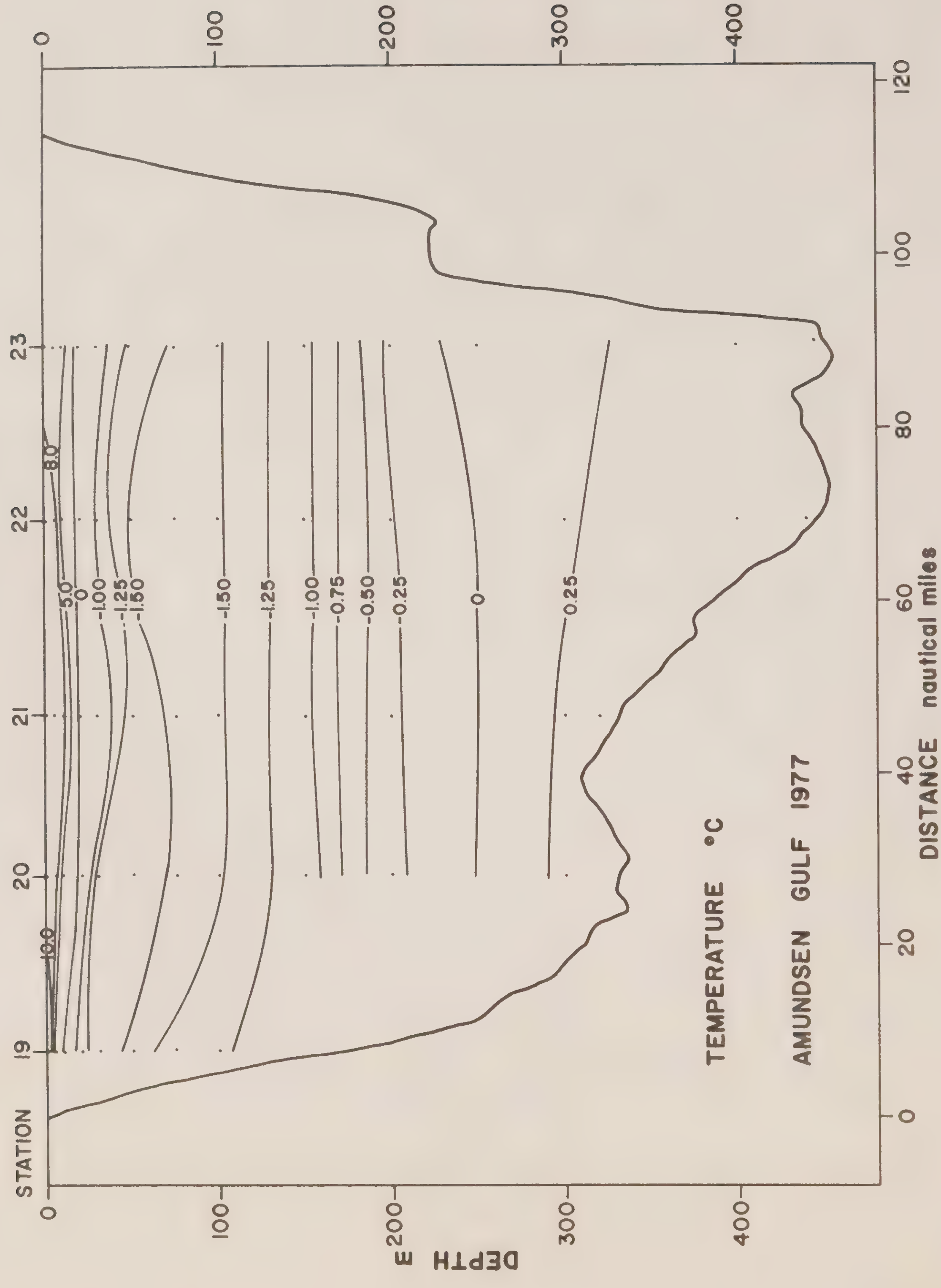

SURFACE
SILICATE
µg At L⁻¹
AMUNDSEN
GULF
4.0
5.0
4.0
116°W 72°N
129°W 72°N
116°W 69°N
129°W 69°N
71°
70°
117°
118°
119°
120°
121°
122°
123°
124°
125°
126°
127°
128°



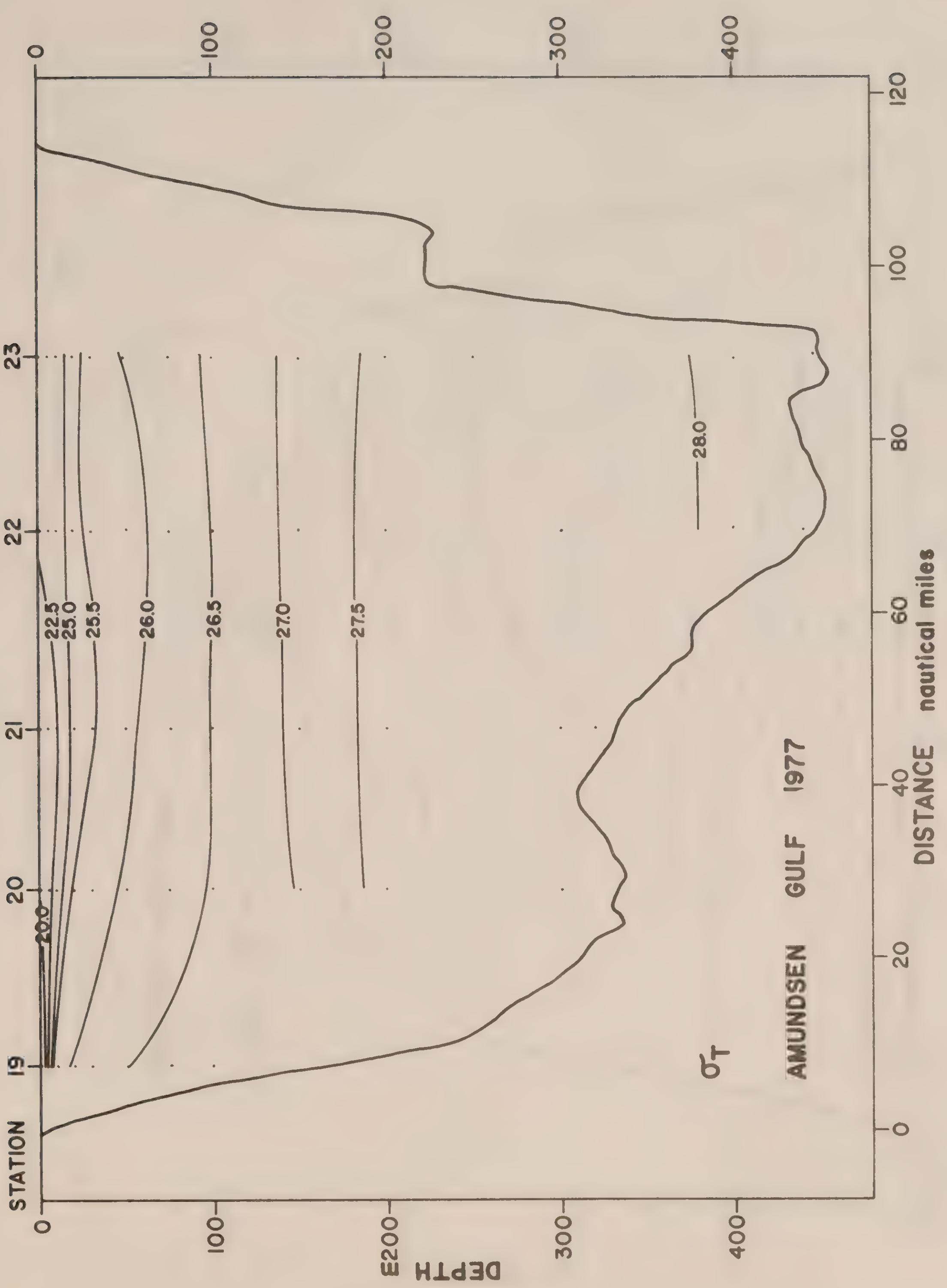
SURFACE
PHOSPHATE
µg At L⁻¹
AMUNDSEN
GULF
0.80
0.85
0.90
0.90
0.95
72°N
69°N
116°W
129°W
70°
71°
117°
118°
119°
120°
121°
122°
123°
124°
125°
126°
127°
128°

CROSS-SECTION CONTOURS

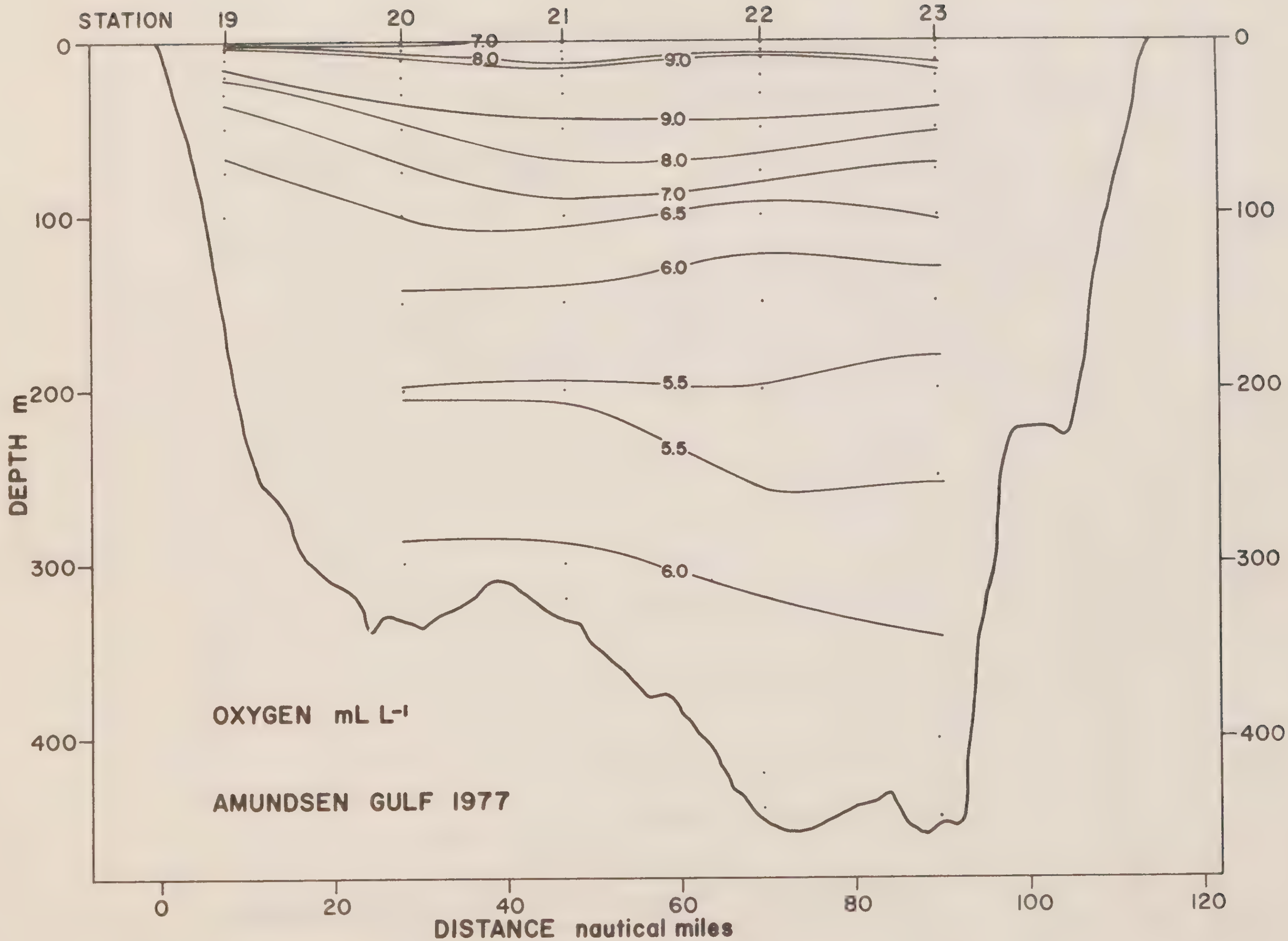

STATION
19
20
21
22
23
DEPTH m
0
100
200
300
400
29.0
31.0
31.5
32.0
32.5
33.0
33.5
34.0
34.5
34.8
SALINITY ‰
AMUNDSEN GULF 1977
DISTANCE nautical miles
0
20
40
60
80
100
120

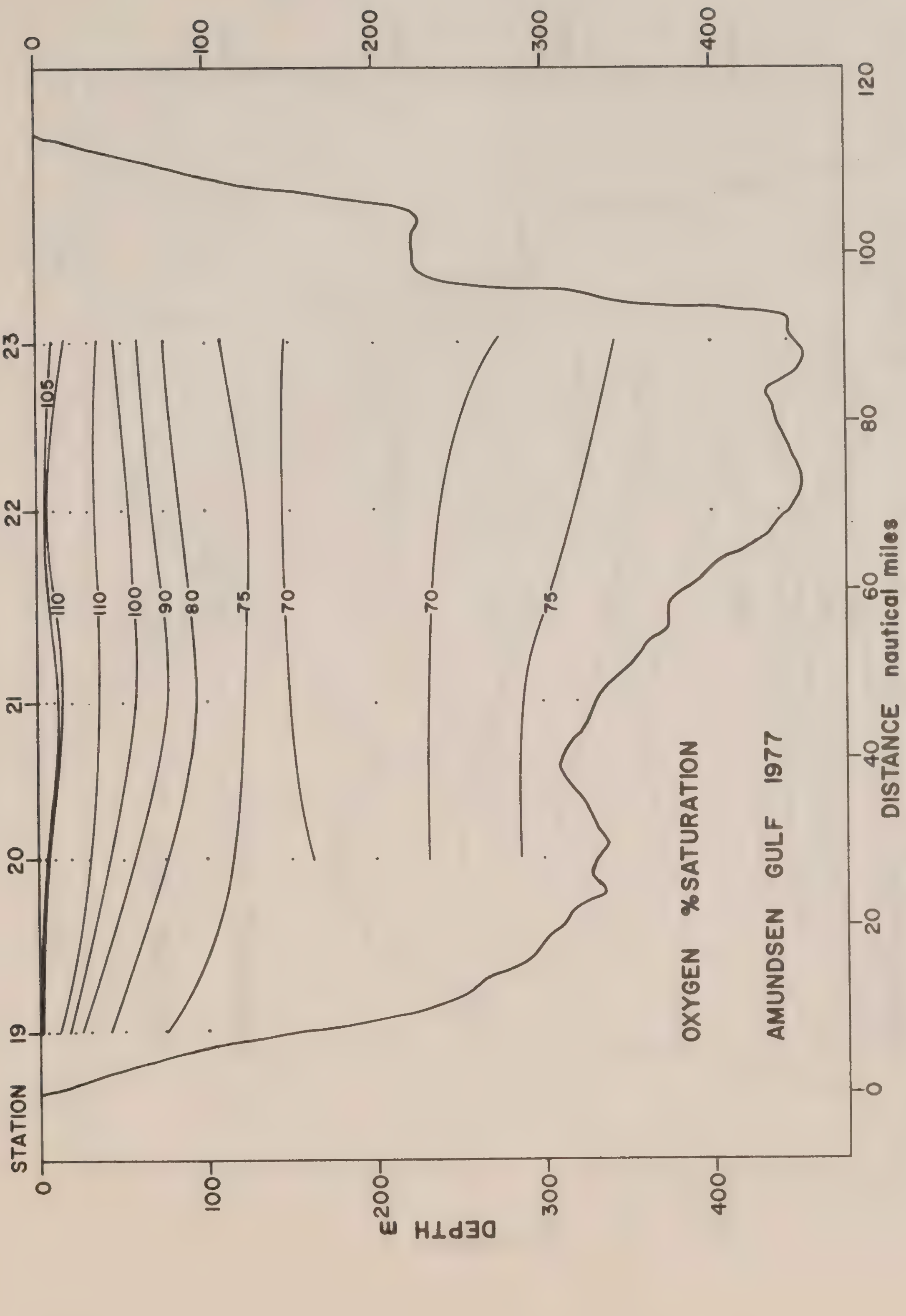


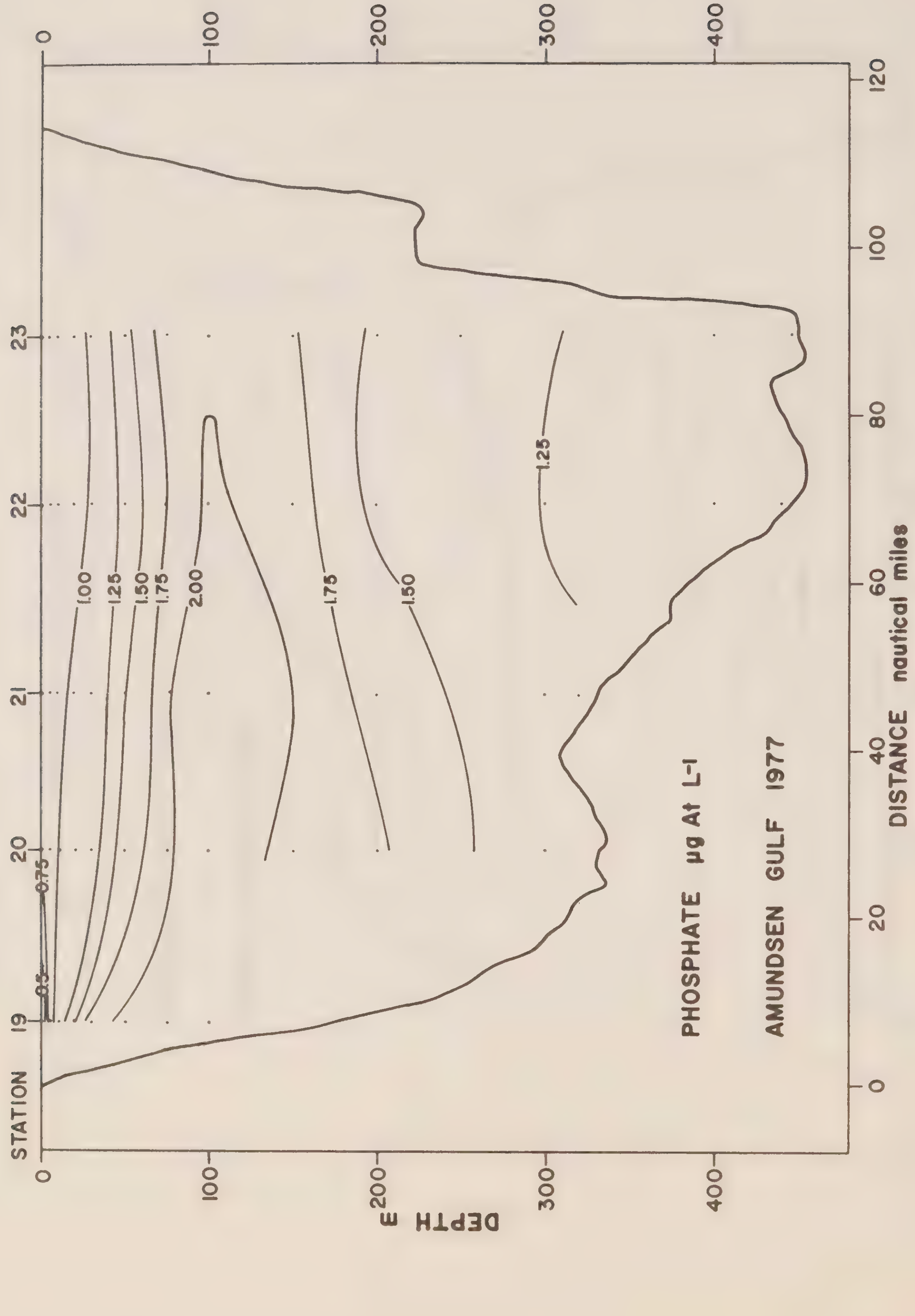
STATION
19
20
21
22
23
DEPTH m
0
100
200
300
400
-10.0
-8.0
-5.0
0
-1.00
-1.25
-1.50
-1.50
-1.25
-1.00
-0.75
-0.50
-0.25
0
0.25
TEMPERATURE °C
AMUNDSEN GULF 1977
DISTANCE nautical miles
0
20
40
60
80
100
120



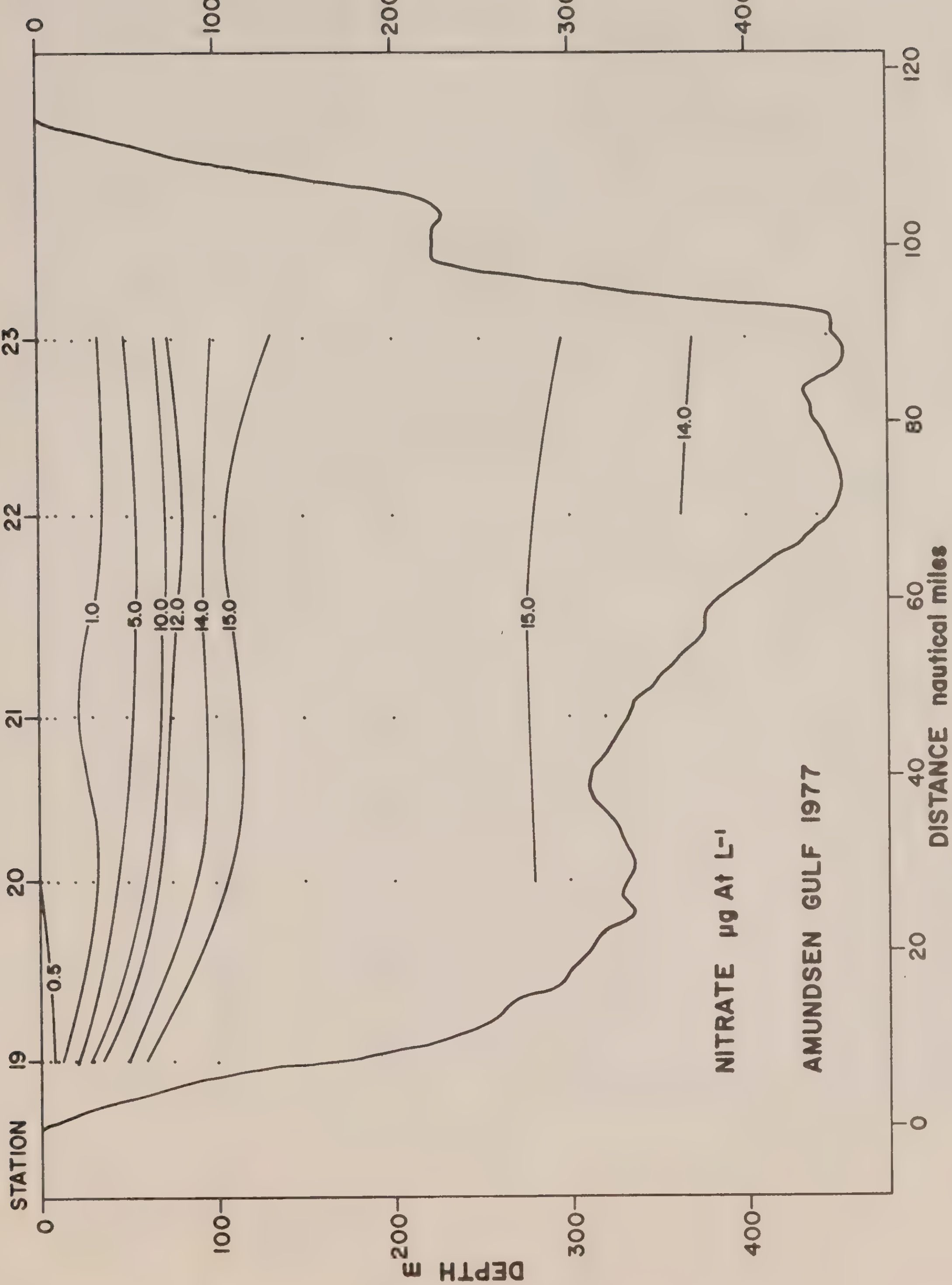
STATION
19
20
21
22
23
DEPTH m
0
100
200
300
400
DISTANCE nautical miles
0
20
40
60
80
100
120
σ_T
AMUNDSEN GULF 1977
20.0
22.5
25.0
25.5
26.0
26.5
27.0
27.5
28.0


STATION
19
20
21
22
23
7.0
8.0
9.0
9.0
8.0
7.0
6.5
6.0
5.5
5.5
6.0
DEPTH m
0
100
200
300
400
OXYGEN mL L-1
AMUNDSEN GULF 1977
DISTANCE nautical miles
0
20
40
60
80
100
120

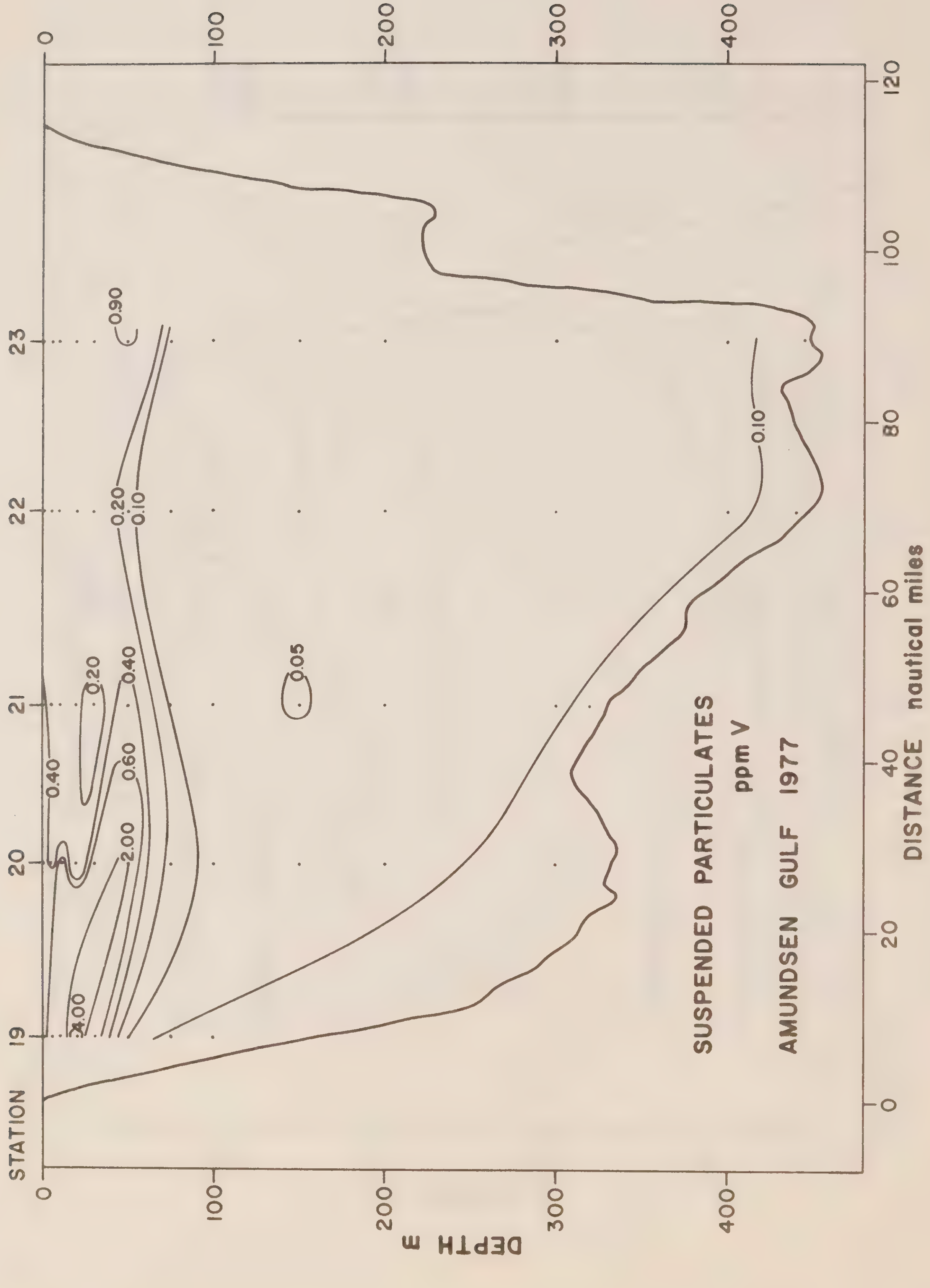

OXYGEN %SATURATION
AMUNDSEN GULF 1977
STATION
19
20
21
22
23
DEPTH m
0
100
200
300
400
DISTANCE nautical miles
0
20
40
60
80
100
120
105
110
110
100
90
80
75
70
70
75



PHOSPHATE µg At L-1
AMUNDSEN GULF 1977
STATION
19
20
21
22
23
DEPTH m
0
100
200
300
400
DISTANCE nautical miles
0
20
40
60
80
100
120
0.5
0.75
1.00
1.25
1.50
1.75
2.00
1.75
1.50
1.25



NITRATE µg At L⁻¹
AMUNDSEN GULF 1977
STATION
19
20
21
22
23
DEPTH m
0
100
200
300
400
DISTANCE nautical miles
0
20
40
60
80
100
120
0.5
1.0
5.0
10.0
12.0
14.0
15.0
15.0
14.0



SUSPENDED PARTICULATES
ppm V
AMUNDSEN GULF 1977
STATION
19
20
21
22
23
DEPTH m
0
100
200
300
400
DISTANCE nautical miles
0
20
40
60
80
100
120
4.00
2.00
0.60
0.40
0.20
0.10
0.90
0.05

Pacific Marine Science Report 78-11

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- A Preliminary Report -

by

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INSTITUTE OF OCEAN SCIENCES, PATRICIA BAY
Sidney, B.C.

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Abstract

Interest in the effects of dumping contaminated sediments into an area of Georgia Strait, B. C. prompted a study of the content of five metals in the holothurian (sea cucumber), Molpadia intermedia. Forty-four samples of ectoderm and muscle tissues of pooled or single specimens were analyzed for Cr, Cd, Cu, Pb, and Zn by flame or flameless atomic absorption spectrophotometry. In addition, eight samples of NBS bovine liver were proved to the contracting analysts as a check on accuracy and precision of the analytical procedure. Variation of metal content in the tissues was wide in all cases and did not permit any practical statistical analysis. Data for the NBS bovine liver samples were acceptable in most cases except for lead.

Acknowledgment

The analytical work for this study was performed by CanTest Laboratories, Vancouver, under contract 08SSKF 832-6-1055.

We thank also Dr. C. Levings and Mr. N. McDaniel for assistance in collecting the study specimens.

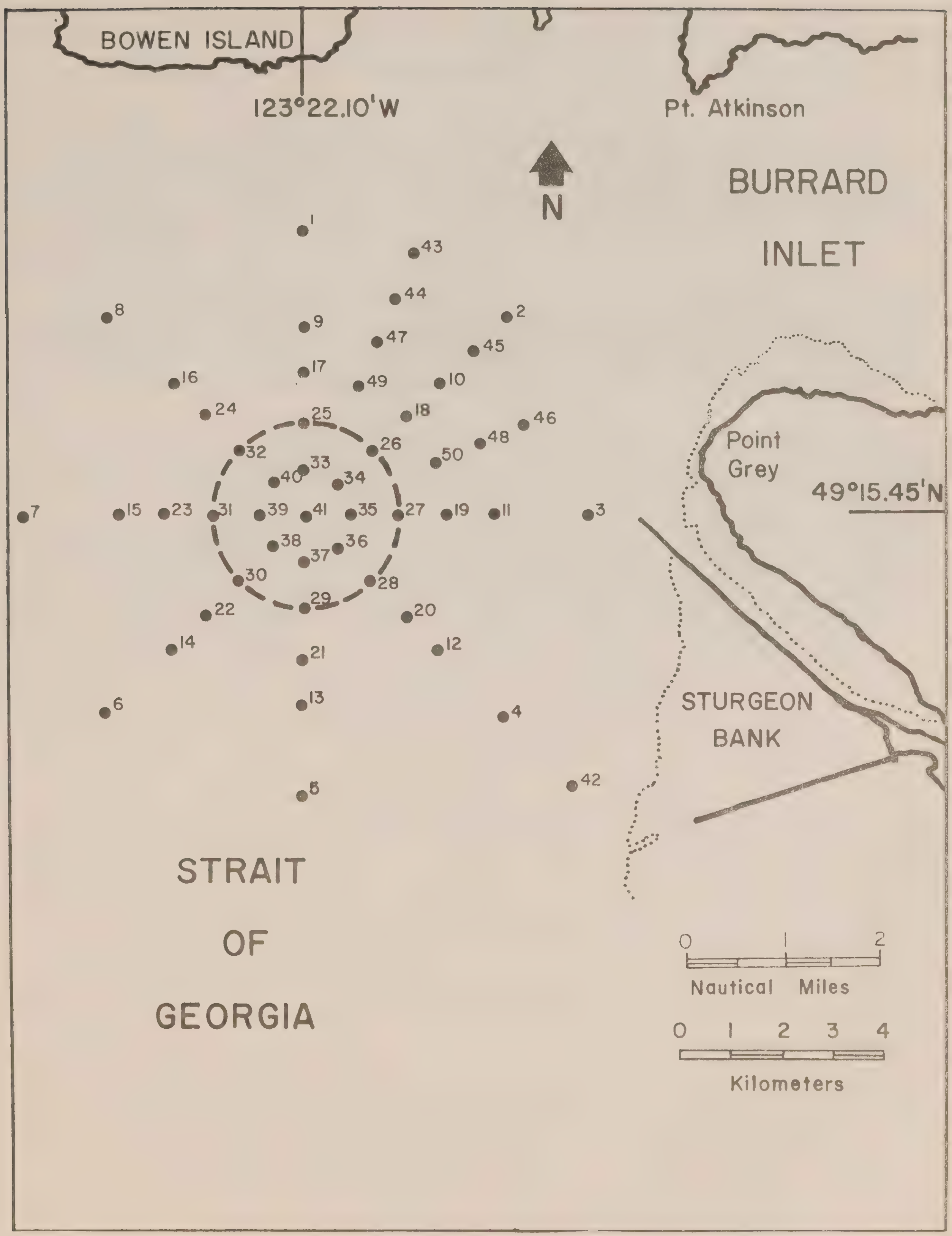

FIGURE 1

Location of Point Grey dump site. Stations shown are those determined by EPS (Hoos, 1977). See text for stations in this group sampled for this study.

Introduction

The Point Grey Dump Site (Fig. 1) is a circular area in Georgia Strait centered at 45^{o} 15.45' N, 123^{o} 22.10' W. It has been used extensively for a number of years for disposal of a wide variety of wastes. A large percentage of the waste was composed of material dredged from heavily industrialized and, consequently, polluted areas such as False Creek in the City of Vancouver (Whiticar, 1974).

Hoos (1977) has described studies conducted by the Environmental Protection Service. Standard chemical oceanographic parameters as well as heavy metal and biological data are reported for sediment samples within the dump-site area and a larger area with a radius of 4.8 km encircling the dump-site.

As part of an assessment of the effects of dumping wastes at sea, relating to the Ocean Dumping Control Act of 1975, scientists at the Pacific Environment Institute, West Vancouver conducted an extensive sampling of benthic invertebrates. Because relatively plentiful numbers existed over the dump-site area, the holothurian (sea cucumber), Molpadia intermedia, was chosen for a survey of heavy metals. It was hoped that levels of selected metals might indicate whether or not bioaccumulation of metals transmitted from polluted sediments was occurring. Two points in another area of Georgia Strait were chosen to provide control specimens.

The results of this initial study are reported herein.

Materials and Methods

All specimens of M. intermedia were obtained on one cruise in March, 1976 aboard the CSS Vector. A Smith-McIntyre benthic grab (Rigosha, Japan) was used to obtain sediment samples which were sieved through a screen with a 0.5 mm mesh.

Each specimen of M. intermedia was cleaned of strongly adhering sediment at the time of collection by a scrub-wash in distilled water. All specimens were placed into Whirl Pak bags and frozen immediately. In the laboratory they were thawed and dissected. The muscle and ectoderm were the only usable tissues. Ectoderm was separated from the muscle and prepared separately. All muscle samples and some selected ectoderms were analysed.

Tissues were placed into individual acid-cleaned glass vials, re-frozen and freeze-dried. The dried material was pulverised in the same vial using a glass rod.

Where sufficient organisms were available replicate samples were prepared. In addition, some replicates were comprised of pooled tissues of two or three animals. Subsamples were prepared from the pooled samples to provide statistical information.

Eight additional samples to be used for check purposes were prepared from NBS Bovine Liver Standard Reference Material No. 1577.

All samples were number coded randomly fron 1 to 44. The relationship of the code to sampling stations and NBS standards is shown in Tables I and II respectively.

For analysis, the samples were weighed accurately and transferred to capped test-tubes. One mL distilled water and 0.5 mL aqua regia were added and the samples were digested for two hours on a hot-water bath. A few drops of H_2O_2 and five drops aqua regia were added and the samples were heated for another hour. Samples were cooled and diluted to volume (10 mL) for subsequent atomic absorption analysis.

Samples were analysed using a Perkin Elmer Model 306 fitted with Model HGA 2100 graphite furnace.

a) Zinc

Zinc was determined by direct aspiration. Reagent blanks carried through the procedure read 0.01 mg L^{-1}.

b) Copper

Copper was determined by direct aspiration. The reagent blank was 0.01 mg L^{-1}.

c) Chromium

Chromium was determined by direct aspiration. Reagent blanks were less than 0.01 mg L^{-1}.

d) Lead

Lead was determined by graphite furnace methods. Reagents contained less than one μg L^{-1}.

e) Cadmium

Cadmium was determined by graphite furnace methods. Reagent blanks were less than one μg L^{-1}.

The contractor also determined nine elements (sodium, iron, copper, magnesium, calcium, zinc, manganese, strontium and barium) in selected samples using the Jarrell-Ash inductively coupled plasma spectrograph, Model 750.

Results and Discussion

Sampling stations occupied in this study are shown in Figure 1. Stations in the dump-site vicinity are situated in the northeasterly quadrant of the area described by Hoos (1977). These particular stations were chosen because of previous heavy metal data, especially for copper, which indicated concentrations in sediments were highest in this area. Wider sampling was also prevented by time constraints. Obtaining sufficient samples in the dump-site area was possible, albeit tedious. Control samples, obtained from two stations in Georgia Strait, off the Sechelt Peninsula, were difficult to obtain as the area proved to be extremely pauperate.

Analytical data for M. intermedia are shown in Table 3. Data for the NBS Bovine Liver Standards are given in Table 4. Five metals were determined. Lack of sufficient samples precluded determination of mercury.

Zinc

Zinc data (Table 3) for M. intermedia muscle tissue for samples from the dump-site ranged from 108 mg kg^{-1} to 375 mg kg^{-1}. Overall mean was 171 ± 55 (32% RSD) mg kg^{-1}. Control station zinc averaged higher at 180 ± 9 mg kg^{-1}. Statistically, no significant difference (especially in light of lop-sided numbers) could be noted. Tables 5 and 6 contain data which have been dissected statistically. They reflect both intra-sample precision (Table 5) and inter-sample levels at given stations (Table 6). Subsample statistics for three stations shown in Table 5 for zinc are quite good with relative standard deviations (RSD) ranging from 0.40 to 6.3%. There is a predictable wider variability between replicate station samples as shown in Table 6 where the RSD range is 9.7 to 23%. The precision obtained for zinc from the eight blind NBS samples provided was well within acceptable limits.

A somewhat different picture was noted for the ectoderm samples (Table 7). Zinc values tended to be considerably lower, at 50-60 mg kg^{-1}, but values for two samples from stations 27 and 41 were nearer those found for muscle tissues.

Copper

Copper concentrations in M. intermedia from the study area averaged 26 $\pm$ 14 mg kg^{-1} (Table 3). The mean for the controls was almost identical at 27 $\pm$ 6 mg kg^{-1}.

Subsample statistics (Table 5) show that the analytical precision for copper is less than that obtained for zinc. Between-sample values for stations 35, 41 and 45 (Table 6) demonstrate an even wider variation. Relative standard deviations ranged from 7.7% (Station 45, 3 samples) to 59% (Station 41, 3 samples).

Ectoderm samples (Table 7) demonstrated lower values for copper although the range was quite wide. The wide range for Cu, and those for other metals, may be due to embedded sediment particles. This possibility would perhaps eliminate the ectoderm as a useful tissue. Muscle tissue would not suffer from this source of contamination.

Bovine liver copper levels determined from our blind samples compared closely to those found for the contractor's own samples. Both sets fell within the NBS error limits although the standard deviation for the contractor's own samples was considerably narrower.

Chromium, Cadmium and Lead

Values for these three elements all varied widely. Content in the tissues was considerably lower than that for Cu and Zn. One high value for Cr in muscle (sample 42A) was perhaps due to contamination. Subsample statistics (Table 5) indicate again that analytical precision is poor especially for Cr. Cadmium RSD values ranged widely. Those for lead were the lowest and most consistent of the three elements. However, there was a large discrepancy between the NBS certified value for lead and the values determined for the eight blind samples submitted. The latter was approximately four times the former, leaving the validity and usefulness of the Molpadia data very questionable. NBS liver data for the contractor's check samples were only slightly above the certified values (Table 4).

Lack of samples and high RSD values preclude meaningful interpretation of replicate statistics (Table 6). Chromium concentrations in the ectoderm samples tended to be higher than those in muscle.

As part of the data manipulations an attempt was made to ascertain statistical significance between controls and samples from the dump-site. No significance, even at the $P = 0.10$ level was calculated using Student's 't' calculations. Given the few controls obtained and high sample variances this would not be surprising.

Also tested were possible significances between samples from within the designated dump-site (Fig. 1) and those obtained in the area adjacent to the site. One significant difference in means was found. It appears (given limited data for the NE quadrant) that zinc levels are higher ($P = 0.025$) within the designated dump-site. The practicality of this information, however, awaits further studies.

The lack of agreement between data for lead in NBS bovine liver samples from our laboratory and those of the contractor illustrate the importance of employing check standards in analytical exercises of this sort.

There is also a surprising lack of agreement between data for copper and zinc by atomic absorption methods and the newer inductively coupled plasma (IPC) spectrograph (Table 8). For both elements, levels by ICPS were higher except for copper in sample 49B. A comparison by Student's 't' test for the muscle tissue samples only indicated, in fact, that the copper data could not be from the same population ($P < 0.01$). Data for Cu, Zn and seven other elements are shown in Table 8. Fairly good agreement with the bovine liver certified value is noted except for magnesium and strontium. Overall, it is felt that AA methods are still more reliable than ICPS.

Although there are numerous references to concentrations of heavy metals in benthic organisms from both pristine and polluted coastal waters of the world, there are none or very few representative of the particular class of organism used in this study. Since uptake and retention of metals tend to be site specific, any comparison with other widely separated areas has limited value. A broader study with statistically sound data for all metals studied possibly would permit some limited comparison.

Conclusions

From the data obtained in this preliminary study it is not apparent that any elevation of heavy metals in M. intermedia from the dump-site area has occurred. There was a statistically significant difference only between the zinc means for animals from within the area proper and those obtained within the 3.7-5.6 km radius (Fig. 1). The usefulness of such information is strictly limited, however.

The importance of providing blind standards for checking the analytical precision of contractors has been demonstrated.

Because of the limited sampling from only the NE quadrant, a second sampling effort was carried out in July, 1977. Stations were selected on a uniform pattern in all quadrants. At least five specimens of M. intermedia were obtained for all but two stations. A second report on the metal content of these samples will follow at a later date.

Table I

List of Station Numbers
and
Corresponding Sample Codes

Stn. No.	Replicates	No. of Organisms in Replicate	Subsamples	Code No.
9	–	1	–	28
18	–	2	A, B	7; 36
25	–	1	–	10
26	–	1	–	41
27	–	1	–	1
34	–	1	–	32
35	1	1	–	23
35	2	1	–	13
40	–	1	–	9
41	1	1	–	42
41	2	1	–	18
41	3	1	–	43
44	1	3	A, B, C	3; 33; 22
44	2	1	–	5
45	1	3	A, B, C	17, 29; 2
45	2	1	–	25
45	3	1	–	44
46	–	1	–	16
49	–	3	A, B, C	37; 14; 34
Control Stn 1	–	1	–	24
Control Stn G	–	2	A, B	8; 40
Ectoderms				
Control Stn 1	–	1	–	27
Control Stn G	–	1	–	20
27	–	1	–	31
35	1	1	–	4
35	2	1	–	39
41	–	1	–	21
46	–	1	–	12

Table II

Code Numbers for NBS Bovine Liver SRM 1577

Subsamples	Code
A	19
B	15
C	26
D	30
E	6
E	38
G	11
H	35

Table III

Heavy Metal Concentrations[a] in muscle tissue of Molpadia intermedia

Code No.	Sample No.	Weight (Dry) Submitted Sample (grams)	Zinc $mg.kg^{-1}$
8	Cont. G A	0.1246	189
40	Cont G B	0.1215	172
24	Cont 1	0.0362	180
		Mean	180 $\pm$ 9
28	9	0.0771	169
7	18 A	0.0811	144
36	18 B	0.0788	147
10	25	0.0745	219
41	26	0.0405	202
1	27	0.0266	297
32	34	0.1075	172
23	35-1	0.0380	171
13	35-2	0.0533	142
9	40	0.0442	375
42	41-1	0.0924	184
18	41-2	0.0706	149
43	41-3	0.0495	115
3	44-1A	0.1561	159
33	44-1B	0.0800	148
22	44-1C	0.0903	156
5	44-2	0.0353	108
17	45-1A	0.0835	169
29	45-1B	0.1033	166
2	45-1C	0.0717	150
25	45-2	0.0450	144
44	45-3	0.0320	175
16	46	0.1052	151
37	49 A	0.1269	144
14	49 B	0.1000	143
34	49 C	0.1027	144
		Mean	171 $\pm$ 55 (32%)[b]

a Dry-weight basis
b Relative standard deviation
c Value for sample 42A excluded from mean

Table III

(continued)

Copper $mg.kg^{-1}$	Chromium $mg.kg^{-1}$	Cadmium $mg.kg^{-1}$	Lead $mg.kg^{-1}$
20	2.2	3.5	1.3
30	1.5	3.1	1.0
30	1.4	2.2	1.1
27 ± 6	1.7 ± 0.4	2.9 ± 0.7	1.1 ± 0.2
19.5	1.3	2.1	1.3
18	1.2	2.5	1.7
30.5	1.4	1.1	0.4
40	0.8	6.7	1.3
20	3.0	0.7	0.7
23	6.8	1.5	2.3
20.5	3.9	0.7	1.1
16	7.9	0.5	3.7
9	0.4	0.9	0.8
11	3.4	0.7	1.3
25	1.1	3.6	0.5
6	1.4	0.6	1.0
18.2	2.4	0.8	0.6
45	0.8	1.6	1.6
54	2.5	1.0	1.1
63	0.9	1.0	1.4
20	42	0.3	2.0
34	2.0	1.9	1.9
45	2.2	3.0	1.6
34	1.1	1.7	2.0
33	2.0	4.2	0.9
38	4.0	1.9	0.9
12	1.3	0.6	1.6
19.2	1.0	1.7	1.0
15	0.6	2.0	1.4
18	1.5	1.9	1.0
26 ± 14 (55%)	2.2 ± 1.8 (84%)[c]	1.7 ± 1.4 (83%)	1.4 ± 0.7 (49%)

Table IV

Trace Metal Levels in NBS Bovine Liver Samples

Code No.	Sample	Zn mg kg^{-1}	Cu mg kg^{-1}	Cr mg kg^{-1}	Cd mg kg^{-1}	Pb mg kg^{-1}
19	A	139	182	<0.1	0.4	1.3
15	B	135	204	<0.1	0.3	1.3
26	C	133	200	0.2	0.1	1.0
30	D	124	201	0.2	0.1	1.2
6	E	132	177	<0.1	0.3	2.2
38	F	124	200	<0.1	0.2	1.5
11	G	133	195	<0.1	0.3	1.1
35	H	130	207	0.9	<0.1	0.3
	Mean	131 ± 5	196 ± 11	--	0.2 ± 0.1	1.4 ± 0.4[a]
Contractor's NBS Bovine Liver Standard		137	193	0.2	0.2	0.4
		138	196	0.3	0.3	0.5
		134	197	0.2	0.3	0.5
	Mean	136 ± 2	195 ± 2	0.2 ± 0.1	0.3 ± 0.1	0.5 ± 0.1
NBS Certified Values		130 ± 10	193 ± 10	b	0.27 ± 0.04	0.34 ± 0.08

a Sample H value not included in Pb mean

b No certified value available

Table V

Subsample Statistics

Sample 44(1)	Zn mg kg^{-1}	Cu mg kg^{-1}	Cr mg kg^{-1}	Cd mg kg^{-1}	Pb mg kg^{-1}
Mean	154.3	54.0	1.4	1.2	1.37
S[a]	5.7	9.0	1.0	0.3	0.25
%[b]	3.7	16.7	71.4	25.0	18.2
Sample 45(1)					
Mean	161.7	37.7	1.77	2.2	1.83
S	10.2	6.4	0.59	0.7	0.21
%	6.3	16.8	33.1	31.8	11.4
Sample 49					
Mean	143.7	17.4	1.03	1.87	1.13
S	0.58	2.16	0.45	0.15	0.23
%	0.40	12.4	43.8	8.2	20.4

a One standard deviation

b Relative standard deviation

Table VI

Station Replicate Statistics

Station 35 (2 samples)	Zn	Cu	Cr	Cd	Pb mg kg^{-1}
Mean	156.5	12.5	4.15	0.7	2.25
S[a]	20.5	4.9	5.3	0.3	2.05
%[b]	13	40	128	40	91
Station 41 (3 samples)					
Mean	149.3	16.4	1.63	1.67	1.73 mg kg^{-1}
S	34.5	9.6	0.68	1.67	0.26
%	23	59	42	100	15
Station 45 (3 samples)					
Mean	160.2	36.2	2.59	2.77	1.21 mg kg^{-1}
S	15.6	2.8	1.23	1.25	0.54
%	9.7	7.7	47	45	44

a, b: As for Table V

Table VII

Analytical Data for Ectoderm Samples

Station	Zn $mg.kg^{-1}$	Cu $mg.kg^{-1}$	Cr $mg.kg^{-1}$	Cd $mg.kg^{-1}$	Pb $mg.kg^{-1}$
27	237	16.5	343	0.3	1.6
35 (1)	62	6	62	0.5	4.6
(2)	56	11	49	0.2	1.2
41	202	20	3.0	0.7	0.7
46	56; 56[a]	3;4	110; 60[a]	<0.1	1.0; 1.7[a]
Control #1	52	6.7	145	0.3	1.6
Control G	52; 58	2; 1	28; 17[a]	0.4; 0.3[a]	1.7

a Repeat determinations by contractor

Table VIII

Plasma Spectrograph Data for Selected Samples[a]

Sample #	Na	Fe	Cu (b)	Mg
41(1)	1.81×10^4	1.84×10^5	11.2 (<1)	1.22×10^4
41(2)	2.39×10^4	1.15×10^3	14.5 (6)	7.67×10^3
44(2)	5.01×10^4	7.68×10^3	33.7 (20)	1.02×10^4
40	2.41×10^4	2.06×10^3	21.9 (11)	6.11×10^3
49B	4.38×10^4	3.35×10^3	5 (15)	7.71×10^3
46	3.70×10^4	3.38×10^3	20 (12)	6.99×10^3
35 (Ectoderm)	6.03×10^4	7.46×10^4	27.8 (6)	1.39×10^4
NBS 'G'	2.71×10^3	310	228 (195)	669
Bovine Liver	2.25×10^3	259	189	541
(Certified Values)	(2.43×10^3)	(270)	(193)	(605)

(a) mg kg^{-1} (dry weight)

(b) AA data from Tables 3, 4, and 7 for comparison

Table VIII

(continued)

Ca	Zn (b)	Mn	Sr	Ba
2.39×10^4	80.6 (21)	2.02×10^3	1.97×10^3	362
3.77×10^3	163 (149)	127	66	8
5.42×10^3	153 (108)	150	96	25
4.32×10^3	403 (375)	307	90.7	12
4.43×10^3	170 (143)	122	102	9
3.60×10^3	180 (151)	47	77	10.6
2.07×10^4	67.5 (62)	731	773	115
158	155 (133)	12	7	17
129	126	9.8	3	6
(123)	(130)	(10.3)	(0.14)	(-)

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OBSERVATIONS OF SEAWATER TEMPERATURE AND SALINITY AT BRITISH COLUMBIA SHORE STATIONS 1976

by

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Abstract

Surface (approx. 1-metre) oceanic salinity and/or temperature have been recorded daily at several locations along the coast of British Columbia for varying lengths of time - from a few months to a few decades. At present, such data are being gathered at sixteen places - of which fifteen are Ministry of Transport lightstations, the remaining one being the Pacific Biological Station, Departure Bay. Temperatures are determined at all sites by means of mercury-in-glass thermometers; salinities are obtained at fourteen sites only, by means of hydrometers. The data so obtained during each calendar year are published in two forms. Firstly, tables provide, for each site, the monthly means and the associated standard deviations, as well as the maximum and minimum values recorded during each month; the annual means are also listed. Secondly, graphs indicate the behaviour, throughout the year, of the data after the higher-frequency oscillations (e.g., those of tidal period) have been removed ("smoothed") by means of a seven-day normally-weighted running mean.

This publication presents the data obtained in 1976.

Introduction

Daily observations of sea-surface temperature and salinity have been made since the early 1930s at numerous locations along the British Columbia coast. During 1976 observations were made at 16 shore stations (page 6). Table 1 lists these stations in north-to-south order along the "outside coast" (Langara Island to Race Rocks) and along the Strait of Georgia (Cape Mudge to Active Pass). The general location of each station, as well as the names of the observers that participated, are also noted. Most of the sampling sites are at lightstations, and the voluntary services of the lightkeepers as observers have been obtained by arrangement with the Ministry of Transport. The Cape St. James station is a combined radiobeacon and meteorological station, and the services of the staff there have been obtained through the kind permission of the Regional Director, Atmospheric Environment Service. The observers at the lightstations receive a payment from Ocean and Aquatic Sciences, of the Department of Fisheries and the Environment, for their work.

This report presents the seawater data obtained from these shore stations during 1976.

Observational Equipment and Procedures

Except at Active Pass, each daily observation is made within one hour before (and as near as possible to) the occurrence of the daytime high tide. The exact time is dependent both upon weather conditions and upon the press of the observer's lightkeeping duties. At Active Pass, observations are made at daylight high-water slack as obtained from the Canadian Tide and Current Tables (Environment Canada, 1976). No sampling is attempted in darkness at any station.

Temperatures are measured by means of a mercury-in-glass thermometer recording within the range 10° to 140° Fahrenheit (F); it is graduated in 1° F intervals. Each thermometer is checked against a calibrated thermometer; the maximum allowable error is taken to be $\pm 0.4^{\circ}$F ($\pm 0.2^{\circ}$C). The seawater temperatures are estimated to 0.1°F. The thermometer, (partially) enclosed in a protective case of 1-in (2.5-cm) aluminum pipe, is attached to the end of a pole (also made of aluminum pipe) which can be as long as about 20 ft (6 m). The thermometer is lowered into the water to a depth of 3 ft (about 1 m) and left at that depth for two minutes. The greatest pole lengths are necessary at sites where observations are carried out from steep ledges. At some stations, water samples are obtained by bucket during inclement weather.

At every station except Sheringham Point and Cape St. James[1], a 25-oz (710-cc) glass or plastic bottle is also attached to the pole. At the same time that the temperature of the seawater is recorded, a sample is drawn from this bottle, for use in the measurement of density by means of a hydrometer. The hydrometers employed are similar to those used by the U.S. Coast and Geodetic Survey (USC&GS) at its tidal stations. (Since 1970, the

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[1] Density (and, therefore, salinity) measurements were terminated at Sheringham Point on 31 March 1970 and at Cape St. James on 31 May 1971.

USC&GS has been a part of the National Ocean Surveys of the National Oceanic and Atmospheric Administration (NOAA).)

Hydrometers actually measure the *specific gravity* of a seawater sample. Specific gravity is a ratio of two densities and is therefore a dimensionless quantity. If however, by definition, distilled water at a temperature of 39.2°F (4°C) has a density $\rho_m = 1$, then the specific gravity of a substance having density ρ is ρ/ρ_m and is numerically equal to the value of ρ.

The density (or specific gravity) of a seawater sample depends upon both the quantity of dissolved material in the sample (the "salinity") and the sample temperature at the time the measurement is made. Densities determined by hydrometer without temperature control must therefore be reduced to some "standard" temperature for conversion to the corresponding salinities. The standard adopted for this program is 15°C (59°F), the same as that presently in use by the USC&GS.

An expression of the general form *Sp. Gr. Tp. (or Temp.)* 15/4°C is provided on every hydrometer utilized in this program. It incorporates both the basis of specific gravity (distilled water at 4°C (29.2°F)) and the standard temperature (15°C or 59°F) employed.

Hydrometers are supplied to the stations in one or more of three ranges of specific gravity: 0.9960 - 1.0110, 1.0100 - 1.0210, and 1.0200 - 1.0310. The scales are divided into intervals of 0.0002, and the instruments can be read to ±0.0001. The hydrometers are read employing techniques described by the USC&GS (Adams, 1942). Each instrument has its calibration checked immediately before being sent to a station.

The time of each daily observation, and the associated seawater temperature and hydrometer readings, are recorded on monthly field sheets. At present, such sheets are mailed to the Pacific Environment Institute, West Vancouver, British Columbia, every two months for preliminary processing.

Preliminary Processing of the Data

This stage consists of several operations. The temperature data are scanned, and values are rejected if it is discovered that a faulty thermometer has been used, or if the value is obviously the result of a misreading or of any other error in technique. The accuracy of "good" individual readings should be within ±0.4°F (±0.2°C). The observed hydrometer readings are reduced to densities at the standard temperature, 15°C (59°F), by means of tables prepared by the USC&GS (Zerbe and Taylor, 1953). The appropriate calibration correction is then applied to each such density value. These corrected values are in turn converted to salinities. A salinity is rejected, again, only if obviously due to misreading of the hydrometer or to other procedural errors. It may be noted that comparisons involving several dozen samples collected at B.C. shore stations have indicated that about 85% of the "hydrometer" salinity data agreed, to within ±0.3°/oo, with the corresponding values determined by laboratory salinometer (Hollister, unpublished).

If observations are missing for *one* day or for *two consecutive* days, the resulting gap is filled by value(s) obtained by linear interpolation utilizing the two observations bounding the gap. No interpolated values are provided when readings are missed for *three or more* consecutive days (whether by accident or by design).

Machine Processing of the Data

For each calendar year, the daily temperature and salinity data remaining after the preliminary procedures noted above are processed into final form by the Marine Environmental Data Service (MEDS) of Ocean and Aquatic Sciences, Department of Fisheries and the Environment, Ottawa. For each station, this machine processing involves the computation of the twelve monthly means for temperature and for salinity, as well as of the corresponding standard deviations. The annual means are also determined. All means are rounded off to the first decimal place, and the standard deviations are truncated at the second decimal place. Data obtained by interpolation are *not* utilized in the computation of the means.

A form of smoothing has been performed on the data to minimize the effect of any variability associated with frequencies large compared to the annual frequency (those associated with tides, for example). For simplicity, the daily values at each sampling station are here considered to be equally-spaced in time - with a sampling interval, therefore, of 24 hours. A seven-day, normally-weighted running mean (e.g., Holloway, 1958) has been utilized for smoothing; this form of filtering is considered to result in an output free of such defects as "polarity reversals" or phase shifts. The running mean is computed, for the entire year, for both temperature and salinity. In order that these means for each station be as continuous as possible consistent with the data involved, interpolated daily values *have* been utilized in the associated computations. However, when a period of greater-than-two consecutive days of missed data is encountered, the computations are interrupted.

Presentation of the Data

The first major section of this report (pp. 14 to 77) subsequent to the text tabulates, in monthly format for each shore station in 1976, the daily values of temperature in ^{o}F and of salinity in parts per thousand (ppt, ^{o}/oo). Three months' data are listed on each page. Also recorded for each month are the mean, the standard deviation (STD, DEV.), the number of observations (OBSVNS.) involved in the computations of these two quantities, and the maximum and minimum values. With the December values for each station are also included the *annual* means (YRLY. MEANS) for temperature and salinity. Each interpolated daily value is identified by an asterisk (*). "Missed" values with which no interpolation is associated are each denoted by a "*0.0" entry. Invalid days, such as April 31, are indicated by a "0.0" entry. On each page, the latitude and longitude of each station (in degrees, minutes and seconds) are noted immediately after the station designation.

It may be noted that, for ease in reference, the monthly- and annual-mean temperatures and salinities are summarized in Tables 2 and 3 respectively. Temperatures in Table 2 are given in ^{o}C (rounded to the first decimal place) rather than in ^{o}F, in deference to the almost-universal use of the Celsius system of temperature measurement in present-day marine science.

"Annual" graphs of the seven-day, normally-weighted running mean for temperature and salinity at each station comprise the second major section of the report (pp 80 to 111). These graphs are copies of the machine plots of the means - reduced for display by present-size pages. Any interruption in the associated computations will result in a gap in the plotted output. Each graph for temperature is provided with a scale in degrees C as well as one in degrees F.

From May 1974 onward, circumstances beyond the control of the program rendered it impossible to carry out observations at Departure Bay on weekends (Saturdays and Sundays) and on statutory holidays. The number of (non-interpolated) values available for determination of each monthly mean has therefore been reduced from, approximately, thirty to twenty at this station. The running-mean calculations have suffered accordingly.

At both Entrance Island and Active Pass, the daily salinity values (and the associated running means) were relatively low during June through September - frequently considerably less than $20^{o}/oo$. The salinity range utilized on pages 109 and 111 has therefore been chosen to be 16 to $30^{o}/oo$, rather than 20 to $34^{o}/oo$ as in the other running-mean plots for salinity. It is felt that the behavior of the mean at these two lightstations during the four-month period can thus be better displayed. (It may be noted that several of the lowest running-mean values calculated for Active Pass are "off scale" even with the shift in range provided.)

Acknowledgements

This sampling program owes its success primarily to the efforts and dedication of the many observers who have taken, or are taking, part in the obtaining of the data. These observers have maintained a remarkable continuity of effort, often in the face of extremely hazardous weather and sea conditions. Excellent assistance has been received from the District Managers and the staffs of the Marine Transportation Division, Ministry of Transport (M.O.T.) in Victoria and Prince Rupert, as well as from the M.O.T. Radio Branch, which has transmitted the numerous messages involved in the program. The computations on the data were carried out by the Data Processing and Analysis Section of MEDS, under the supervision of Mr. J. Nasr.

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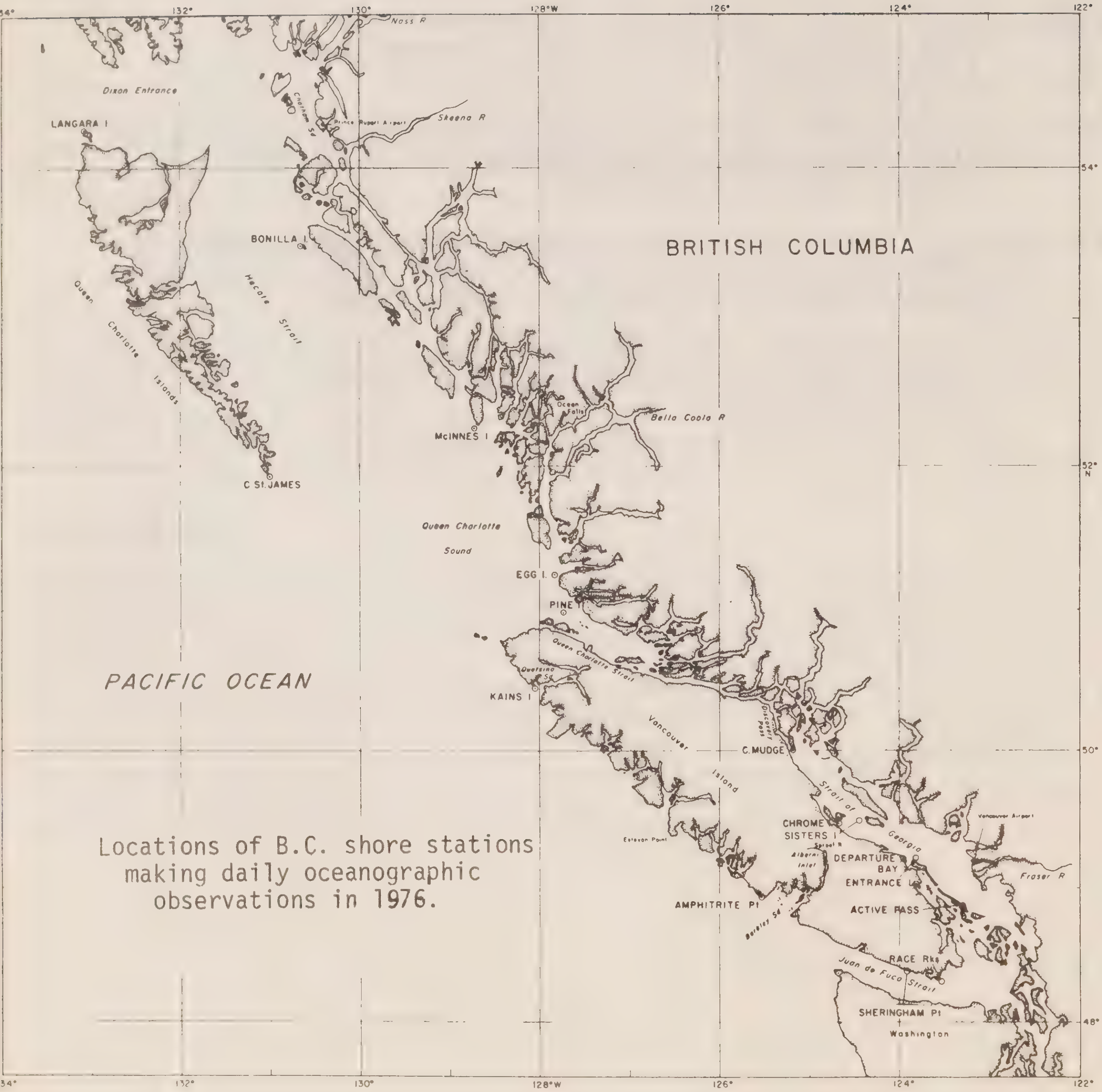


Locations of B.C. shore stations making daily oceanographic observations in 1976.

Table 1. B.C. shore stations making oceanographic observations in 1976: general locations, and names of observers.

Station	Location	Observer(s)
Langara Island	Dixon Entrance, south side	L. Sabourin (Mrs.)
Bonilla Island	Hecate Strait, north	R.A. Nagel B.R. Jones M. Slater
McInnes Island	Milbanke Sound entrance, north side	F.M. Collette (Mrs.) D. Michaud (Miss)
Cape St. James	Queen Charlotte Islands, south end	G. Anderson D.C. Robinson D.S. Robinson (Mrs.)
Egg Island	Smith Sound, southern entrance	K. Carson (Mrs.)
Pine Island	Queen Charlotte Strait, western entrance	V.C. Emrich (Mrs.) M.C. Tutt (Mrs.) E. Chapman (Mrs.)
Kains Island	Quatsino Sound entrance, north side	L.C. Collins (Mrs.)
Amphitrite Point	Barkley Sound, western entrance	I.G. McNeil K. Nuttall
Sheringham Point	Juan de Fuca Strait, northern shore	E.S. Bruton (Mrs.)
Race Rocks	Juan de Fuca Strait, eastern end	F.B. Anderson (Mrs.)
Cape Mudge	Strait of Georgia, northern entrance	R. Wilkie R. Lundy
Sisters Island	Strait of Georgia, central	D.J. McNeil W. Milne R.J. Grunert
Chrome Island	Strait of Georgia, central western shore	W.E. Gardner
Departure Bay	Strait of Georgia, central western shore	D. Pozar
Entrance Island	Strait of Georgia, central western shore	E. Cehak (Mrs.)

Table 1 continued

Station	Location	Observer(s)
Active Pass	Strait of Georgia, southwestern shore	J.E. Ruck

Table 2. Monthly- and annual-mean temperatures (°C) - 1976.

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Langara I.	5.8	5.2	5.4	6.7	7.9	9.4	11.3	12.1	12.2	10.6	9.3	8.3	8.7
Bonilla I.	6.2	5.7	5.7	6.9	8.3	9.9	12.0	12.4	12.2	10.7	9.0	7.8	8.9
McInnes I.	6.4	6.2	5.8	7.1	8.5	10.6	12.8	12.9	12.4	10.7	8.8	7.7	9.2
Cape St. James	7.3	6.7	6.3	6.8	7.6	9.1	10.0	11.0	11.1	10.4	9.1	8.6	8.7
Egg I.	6.8	6.3	6.5	7.9	9.3	12.6	12.4	12.5	11.7	10.0	8.6	7.6	9.2
Pine I.	7.1	6.8	6.7	7.3	7.9	8.7	9.2	9.5	9.6	9.4	9.1	8.2	8.3
Kains I.	7.2	6.9	7.2	8.3	9.7	10.7	12.3	12.9	13.8	12.0	9.9	8.8	10.0
Amphitrite Pt.	7.5	7.3	7.1	8.8	9.9	10.8	12.9	12.5	12.9	11.4	10.2	8.9	10.1
Sheringham Pt.	7.3	7.1	7.1	7.9	9.1	9.9	10.7	10.4	10.3	9.8	8.8	8.1	8.9
Race Rocks	7.3	7.1	7.0	7.8	8.7	9.4	10.1	10.2	10.1	9.4	8.7	8.1	8.7
Cape Mudge	7.2	6.9	7.4	8.8	9.8	12.6	13.6	14.5	13.3	10.6	8.8	7.9	10.2
Sisters I.	6.7	6.7	6.7	8.6	11.5	13.7	16.1	16.4	15.2	11.7	9.2	7.9	10.9
Chrome I.	7.1	7.0	6.9	8.6	10.6	12.9	15.2	15.4	14.2	11.6	9.3	8.2	10.6
Departure Bay	6.6	6.3	7.1	10.6	11.2	14.8	16.8	16.3	15.1	12.9	9.8	8.5	11.3
Entrance I.	6.6	6.7	6.6	8.7	11.1	13.2	15.8	15.3	14.9	11.7	9.1	7.9	10.7
Active Pass	6.7	6.7	6.7	8.6	10.4	12.6	14.6	13.4	13.6	11.3	9.0	8.1	10.2

Table 3. Monthly- and annual-mean salinities (ppt, °/∘∘) - 1976.

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Langara I.	32.5	32.5	32.4	32.4	32.5	32.4	32.1	32.1	32.2	32.2	32.4	32.4	32.3
Bonilla I.	31.5	31.2	31.3	31.3	31.2	31.1	31.0	30.7	30.8	30.8	30.8	31.0	31.1
McInnes I.	30.1	30.1	30.4	30.1	30.0	28.6	28.1	28.1	27.8	29.1	29.1	29.1	29.2
Egg I.	30.7	30.6	30.8	30.7	29.9	24.0	27.8	27.2	29.6	30.1	30.8	30.4	29.6
Pine I.	30.6	30.5	30.7	31.1	31.2	31.1	30.9	30.9	31.1	31.4	31.5	31.1	31.0
Kains I.	28.9	28.9	29.7	29.6	30.0	30.0	30.8	31.5	30.8	31.1	29.8	28.3	30.0
Amphitrite Pt.	27.1	28.1	27.7	28.8	30.1	30.2	29.8	29.6	29.3	29.1	29.1	28.8	29.0
Race Rocks	30.8	31.1	31.1	31.3	31.6	31.7	31.5	31.3	30.7	30.7	31.1	31.3	31.2
Cape Mudge	28.2	28.4	28.7	28.9	28.9	27.1	26.2	25.4	25.6	27.9	28.6	28.7	27.7
Sisters I.	27.9	28.3	28.5	29.0	27.5	24.2	22.3	22.0	23.7	26.7	28.3	29.1	26.4
Chrome I.	28.7	29.2	29.4	29.5	29.2	27.1	26.0	26.1	26.5	28.4	29.0	28.7	28.1
Departure Bay	25.4	27.0	26.9	27.2	26.9	23.0	22.2	22.8	21.4	26.3	27.3	28.2	25.3
Entrance I.	26.7	27.4	27.8	27.7	27.1	22.4	21.4	21.8	21.0	25.6	26.9	27.8	25.3
Active Pass	27.0	27.3	28.3	27.1	25.5	21.9	21.7	23.8	21.4	25.0	26.2	27.9	25.3

Tabulations of Daily Sea-Surface

Temperature and Salinity

1976

TEMP: Temperature (^{o}F)

SAL: Salinity (ppt, ^{o}/oo)

LANGARA ISLAND 54 15 19 N 133 03 30 W

	JANUARY		FEBRUARY		MARCH	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	43.9	32.3	45.0	32.3	38.5	32.8
2	42.5	32.4	43.0	32.3	36.0	32.7
3	43.0	32.5	43.5	32.5	39.9	32.3
4	43.0	32.5	43.5	32.5	40.0	32.1
5	43.2	32.3	44.0	32.3	41.9	32.5
6	39.0	31.9	45.0	32.3	42.5	32.3
7	40.0	31.9	42.0	32.4	42.2	32.4
8	40.0	32.7	40.0	32.7	42.9	32.4
9	39.5	32.7	41.9	32.1	41.5	32.9
10	42.0	32.4	42.0	32.3	41.0	32.5
11	41.5	32.4	42.5	32.3	42.0	32.1
12	41.5	32.5	41.0	32.7	41.5	32.4
13	42.0	32.7	41.5	32.8	41.5	32.3
14	42.5	32.4	41.5	32.8	42.0	32.8
15	43.5	32.7	41.2	32.8	41.3	32.4
16	43.9	32.5	41.0	32.9	42.1	32.3
17	43.6	32.5	43.5	32.9	43.0	32.1
18	* 43.8	* 32.5	43.0	32.9	43.0	32.1
19	44.0	32.5	43.5	32.8	40.9	32.1
20	43.5	32.7	41.9	32.4	42.9	32.7
21	43.0	32.7	42.2	32.5	42.2	32.9
22	41.0	32.1	41.5	32.1	42.9	32.1
23	40.0	32.1	41.0	31.8	41.7	32.8
24	41.0	32.1	40.5	32.8	42.0	32.1
25	41.5	32.0	41.0	32.8	42.0	32.8
26	* 42.6	* 32.3	39.9	32.8	42.9	32.7
27	43.8	32.7	35.5	32.8	41.8	32.3
28	44.1	32.5	39.2	32.7	42.0	32.3
29	44.0	32.8	31.5	* 32.7	42.7	32.5
30	44.9	32.8	0.0	0.0	43.2	32.1
31	44.9	32.8	0.0	0.0	42.9	32.5
MEANS	42.4	32.5	41.3	32.5	41.7	32.4
OBSVNS.	29	29	29	28	31	31
MAXIMUM	44.9	32.8	45.0	32.9	43.2	32.9
MINIMUM	39.0	31.9	31.5	31.8	36.0	32.1
STD.DEV.	1.65	.27	2.63	.29	1.48	.27

LANGARA ISLAND 54 15 19 N 133 03 30 W

	APRIL		MAY		JUNE			1976
DATE	TEMP	SAL	TEMP	SAL	TEMP		SAL	
1	43.3	32.4	46.2	32.5	47.5		32.3	
2	43.0	32.3	46.5	32.9	47.3		32.8	
3	43.0	32.3	46.7	32.3	47.7		32.4	
4	42.9	32.4	46.9	32.5	47.6		32.5	
5	43.6	32.5	45.0	32.4	48.0		32.5	
6	44.0	32.5	45.9	32.5	48.6		32.5	
7	44.4	32.4	45.1	32.3	48.3	*	32.6	
8	44.0	32.3	45.9	32.5	48.2		32.8	
9	43.8	32.3	46.0	32.3	48.0		32.5	
10	44.2	32.7	45.5	32.7	47.0		32.9	
11	43.5	32.5	44.9	31.8	46.9		32.8	
12	43.7	32.3	45.7	32.5	48.3		32.7	
13	44.0	32.8	46.2	32.4	46.4		32.8	
14	42.7	31.9	45.8	32.7	48.0		32.7	
15	44.0	32.1	46.0	31.8	48.7		32.7	
16	43.9	32.7	45.7	32.5	51.3		32.7	
17	43.9	32.4	46.4	32.8	49.0	*	32.6	
18	43.9	32.4	47.0	32.8	49.5		32.5	
19	44.7	32.1	46.3	32.5	49.3		32.3	
20	44.5	32.7	45.9	32.3	48.3		32.5	
21	44.2	32.1	45.0	32.5	48.3		32.4	
22	43.2	32.3	46.0	32.9	50.6		32.3	
23	43.9	32.7	45.7	32.5	47.8		32.1	
24	43.4	32.7	45.4	32.3	50.1		31.5	
25	44.6	32.3	47.3	31.4	49.8		31.6	
26	45.0	32.5	46.6	32.9	53.5		31.9	
27	45.2	32.5	47.5	32.9	52.8		31.6	
28	45.5	32.5	47.5	32.5	52.3		32.1	
29	45.4	32.5	47.2	32.5	49.3		32.3	
30	45.5	32.8	47.6	32.8	49.1		32.3	
31	0.0	0.0	48.0	32.5	0.0		0.0	
MEANS	44.0	32.4	46.3	32.5	48.9		32.4	
OBSVNS.	30	30	31	31	30		28	
MAXIMUM	45.5	32.8	48.0	32.9	53.5		32.8	
MINIMUM	42.7	31.9	44.9	31.4	46.4		31.5	
STD.DEV.	.77	.22	.80	.34	1.74		.38	

LANGARA ISLAND 54 15 19 N 133 03 30 W

	JULY		AUGUST		SEPTEMBER 1976	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	48.9	32.3	54.9	32.3	53.7	32.1
2	50.4	32.4	52.2	32.7	53.6	32.5
3	48.2	32.3	52.9	31.6	54.4	32.1
4	51.7	32.4	53.4	32.0	52.5	32.5
5	52.3	32.3	54.1	31.8	53.2	32.5
6	52.1	32.4	53.7	31.5	53.4	32.1
7	51.4	32.4	53.8	30.7	54.2	32.3
8	50.8	32.4	53.4	31.5	54.1	32.0
9	51.6	31.9	52.6	32.4	54.9	32.5
10	52.7	32.4	53.4	32.0	54.9	32.5
11	53.2	32.7	52.9	31.9	53.8	32.5
12	52.4	32.4	54.7	32.7	53.0	32.4
13	53.0	31.6	54.2	32.1	53.6	32.1
14	51.8	31.9	* 54.4	* 32.1	54.9	32.3
15	51.6	31.9	54.6	32.0	54.8	31.9
16	52.0	31.5	54.3	32.5	54.6	31.9
17	51.0	31.0	54.9	31.9	* 54.7	* 32.1
18	49.9	32.0	53.1	31.9	54.8	32.4
19	51.5	31.8	53.9	32.1	55.0	32.4
20	53.2	31.8	54.2	32.5	54.7	32.5
21	53.5	31.4	53.8	31.9	54.3	32.3
22	52.3	31.9	53.1	32.1	54.5	32.1
23	53.1	31.9	53.4	32.8	53.7	31.9
24	53.9	32.0	53.0	32.5	52.9	32.5
25	52.9	31.9	53.8	32.7	53.3	32.3
26	53.2	32.3	53.6	32.1	53.7	32.0
27	53.9	32.0	53.4	31.9	54.5	31.9
28	53.9	32.0	53.3	32.5	54.0	31.9
29	54.3	32.7	52.9	31.9	53.7	32.0
30	55.0	32.8	54.3	32.5	53.6	31.6
31	54.9	32.7	54.4	32.4	0.0	0.0
MEANS	52.3	32.1	53.7	32.1	54.0	32.2
OBSVNS.	31	31	30	30	29	29
MAXIMUM	55.0	32.8	54.9	32.8	55.0	32.5
MINIMUM	48.2	31.0	52.2	30.7	52.5	31.6
STD.DEV.	1.59	.41	.69	.45	.69	.25

LANGARA ISLAND 54 15 19 N 133 03 30 W

	OCTOBER		NOVEMBER		DECEMBER	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	52.5	31.4	49.4	31.8	47.9	32.9
2	52.1	31.9	50.7	31.9	46.9	32.3
3	52.2	32.0	51.6	31.9	46.3	32.3
4	51.4	32.3	49.7	32.1	45.8	32.9
5	51.2	32.0	49.9	32.3	48.2	32.8
6	51.9	31.9	49.8	32.3	47.5	32.5
7	52.8	31.9	49.4	32.3	47.4	32.8
8	53.2	32.1	48.2	32.5	46.5	31.6
9	52.1	32.0	49.8	32.8	47.0	32.5
10	52.9	32.0	51.7	32.8	47.2	32.5
11	52.0	32.3	51.2	32.5	46.8	32.4
12	52.0	31.9	50.3	32.3	47.7	32.5
13	51.7	32.1	51.0	32.5	47.2	32.1
14	51.2	32.4	51.3	32.3	46.3	32.8
15	50.7	31.9	49.7	32.4	47.1	32.7
16	49.2	32.1	48.7	31.5	* 46.6	* 32.4
17	49.8	31.8	48.3	32.8	46.0	32.1
18	49.9	31.9	48.4	32.5	46.6	32.7
19	48.5	31.5	* 48.0	* 32.6	46.9	32.5
20	50.4	31.5	47.6	32.8	47.2	32.7
21	50.8	32.7	46.5	32.5	47.7	32.7
22	49.4	32.4	47.7	32.5	46.3	32.4
23	49.6	32.5	47.6	32.7	47.5	32.1
24	49.1	32.4	47.1	* 32.7	46.7	32.3
25	51.2	32.5	47.4	32.7	47.4	31.8
26	52.3	32.4	47.1	32.7	46.5	31.9
27	52.8	32.9	46.7	32.4	47.1	31.8
28	48.4	32.5	46.1	32.5	47.5	31.6
29	48.9	32.4	46.6	32.5	47.4	32.0
30	51.7	32.3	45.6	32.4	46.8	32.3
31	50.6	32.8	0.0	0.0	46.2	32.4
MEANS	51.0	32.2	48.8	32.4	47.0	32.4
OBSVNS.	31	31	29	28	30	31
YRLY.MEANS....................................					47.6	32.3
MAXIMUM	53.2	32.9	51.7	32.8	48.2	32.9
MINIMUM	48.4	31.4	45.1	31.5	45.8	31.6
STD.DEV.	1.40	.37	1.75	.32	.59	.37

BONILLA ISLAND 53 29 39 N 130 38 04 W

	JANUARY		FEBRUARY		MARCH	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.0	31.8	45.0	31.5	38.0	31.4
2	42.1	31.5	44.3	31.5	40.0	31.2
3	43.2	31.8	44.2	31.6	41.0	31.2
4	44.4	31.8	42.8	31.5	41.8	31.5
5	44.0	31.8	43.0	31.6	42.0	31.5
6	36.5	31.8	42.7	31.5	42.0	31.2
7	40.0	31.8	42.5	31.2	43.0	31.2
8	42.0	32.0	42.4	31.4	43.2	31.2
9	* 43.1	* 31.9	42.6	31.2	42.8	31.4
10	44.2	31.8	42.8	31.4	* 42.3	* 31.5
11	44.6	31.9	42.0	31.0	41.8	31.6
12	42.0	31.5	41.8	31.0	41.7	31.4
13	42.0	31.6	43.0	31.1	42.2	31.4
14	* 42.9	* 31.6	43.8	31.1	42.8	31.4
15	* 43.8	* 31.5	42.0	31.0	41.2	31.4
16	44.7	31.4	42.8	31.0	42.0	31.6
17	44.0	31.4	42.2	31.0	42.8	31.4
18	44.0	31.2	43.0	31.1	44.0	30.8
19	44.1	31.5	42.8	31.1	43.8	31.1
20	44.4	31.5	43.2	31.1	44.0	31.1
21	44.5	31.4	43.0	31.1	42.0	31.1
22	41.9	31.5	42.8	31.1	42.2	31.1
23	42.0	31.4	41.0	31.1	42.2	31.4
24	42.7	31.2	41.0	31.2	42.0	31.1
25	41.8	31.2	39.0	31.4	41.9	31.4
26	43.6	31.2	40.0	31.1	41.7	31.2
27	44.0	31.5	41.2	31.6	41.9	31.2
28	44.2	31.1	39.0	31.2	43.0	31.5
29	44.0	31.5	39.2	31.4	43.0	31.2
30	45.0	31.2	0.0	0.0	44.1	31.4
31	44.1	31.4	0.0	0.0	43.2	31.6
MEANS	43.1	31.5	42.2	31.2	42.2	31.3
OBSVNS.	28	28	29	29	30	30
MAXIMUM	45.0	32.0	45.0	31.6	44.1	31.6
MINIMUM	36.5	31.1	39.0	31.0	38.0	30.8
STD.DEV.	1.73	.25	1.59	.21	1.23	.19

BONILLA ISLAND 53 29 39 N 130 38 04 W

	APRIL		MAY		JUNE	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	42.4	31.4	46.2	31.0	47.9	31.4
2	43.7	31.4	46.8	31.0	48.0	31.2
3	42.5	31.2	46.4	30.8	50.2	31.1
4	43.0	31.2	45.9	31.1	49.6	31.2
5	43.2	31.4	47.1	31.1	50.0	31.4
6	43.0	31.2	47.3	31.4	47.1	31.0
7	43.4	31.5	45.5	31.1	47.8	31.1
8	43.5	31.5	45.5	31.1	48.0	31.5
9	43.4	31.4	46.2	31.1	48.1	30.6
10	43.7	31.4	46.4	31.1	48.0	31.4
11	44.2	31.1	45.3	31.0	49.2	31.2
12	44.0	31.2	47.2	31.0	50.0	31.4
13	43.7	31.4	47.6	31.4	48.7	31.0
14	44.0	31.4	49.6	31.2	50.1	31.2
15	44.5	31.2	48.3	31.2	49.7	31.0
16	44.0	31.5	46.1	31.2	50.2	30.7
17	45.7	31.5	46.4	31.4	49.0	30.8
18	44.2	31.1	47.8	31.5	50.8	30.8
19	44.8	30.8	47.7	31.1	51.1	30.8
20	44.8	31.2	47.8	31.4	50.2	30.8
21	44.7	31.2	46.0	31.2	50.3	31.0
22	43.8	31.0	46.4	31.2	50.2	31.0
23	* 43.8	* 31.2	46.4	30.8	50.2	31.2
24	43.7	31.4	46.2	31.1	51.3	31.1
25	45.0	31.5	46.9	31.2	51.0	31.2
26	46.7	31.4	48.8	31.8	51.3	31.5
27	46.7	31.2	46.2	31.2	52.0	31.5
28	49.8	31.4	48.2	31.5	51.3	31.4
29	49.8	31.4	48.8	31.4	51.6	31.1
30	46.0	31.1	46.7	30.7	52.2	31.2
31	0.0	0.0	47.9	31.0	0.0	0.0
MEANS	44.5	31.3	47.0	31.2	49.8	31.1
OBSVNS.	29	29	31	31	30	30
MAXIMUM	49.8	31.5	49.6	31.8	52.2	31.5
MINIMUM	42.4	30.8	45.3	30.7	47.1	30.6
STD.DEV.	1.81	.17	1.08	.23	1.39	.25

BONILLA ISLAND 53 29 39 N 130 38 04 W

	JULY		AUGUST		SEPTEMBER 1976	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	54.1	31.2	54.8	31.1	53.2	31.0
2	53.0	31.1	55.0	31.0	52.9	31.0
3	* 53.0	* 31.2	53.9	30.4	53.0	30.2
4	53.0	31.4	54.0	30.8	54.8	30.6
5	51.8	31.4	53.0	30.7	56.0	30.7
6	52.3	31.2	53.0	31.0	56.6	30.8
7	53.2	31.0	52.0	31.0	56.4	30.6
8	52.1	31.1	55.0	31.0	53.8	29.9
9	52.1	30.8	53.0	31.0	53.8	30.2
10	52.0	30.8	53.0	30.4	54.0	30.6
11	52.8	31.0	55.0	30.6	55.5	30.8
12	54.1	31.0	53.0	29.9	54.5	31.0
13	54.0	31.0	55.5	30.2	53.2	30.6
14	54.0	31.0	54.0	30.3	54.4	30.8
15	53.0	31.0	57.0	30.3	53.4	31.0
16	56.0	31.1	55.0	30.4	53.4	30.8
17	54.0	30.8	56.0	30.3	52.6	31.0
18	57.0	31.1	52.8	30.8	51.9	30.8
19	52.2	31.2	53.8	29.9	53.0	31.1
20	52.3	31.1	54.0	30.6	54.4	31.1
21	52.5	30.7	54.5	30.7	54.9	31.1
22	53.0	30.7	54.8	30.6	53.6	31.0
23	53.0	30.7	56.3	30.7	53.9	30.4
24	54.0	30.8	55.2	30.6	53.8	30.6
25	52.5	30.4	54.2	30.7	54.2	30.8
26	55.0	30.6	53.0	31.0	54.5	31.0
27	53.0	30.7	53.9	30.7	54.8	31.1
28	54.9	30.7	55.0	31.0	52.9	31.0
29	55.2	31.2	55.7	31.0	53.6	31.1
30	55.9	30.9	55.9	31.0	53.2	31.1
31	55.0	31.2	55.0	31.0	0.0	0.0
MEANS	53.6	31.0	54.4	30.7	54.0	30.8
OBSVNS.	30	30	31	31	30	30
MAXIMUM	57.0	31.4	57.0	31.1	56.6	31.1
MINIMUM	51.8	30.4	52.0	29.9	51.9	29.9
STD.DEV.	1.35	.24	1.22	.34	1.11	.31

BONILLA ISLAND 53 29 39 N 130 38 04 W

	OCTOBER		NOVEMBER		DECEMBER	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	51.8	31.1	48.0	30.6	46.9	30.4
2	52.0	31.2	48.6	30.8	47.3	31.0
3	52.2	31.1	50.2	31.5	46.4	31.0
4	52.1	31.1	49.4	31.6	46.2	30.8
5	52.9	31.1	49.3	31.6	46.0	30.7
6	53.0	30.4	49.5	31.5	46.5	31.0
7	54.0	31.2	49.4	31.6	47.0	30.8
8	53.0	31.1	49.2	31.5	46.5	30.8
9	54.4	31.0	50.2	31.5	46.2	31.0
10	53.8	31.2	50.0	31.2	46.8	30.8
11	52.9	31.2	49.8	30.6	46.0	30.8
12	52.7	31.0	49.6	30.8	47.1	30.4
13	52.3	31.2	49.1	30.3	* 46.6	* 30.5
14	52.0	31.1	47.5	30.0	46.0	30.7
15	51.4	31.2	47.8	30.2	46.7	30.7
16	51.0	31.2	47.0	30.3	46.3	31.1
17	50.2	31.2	47.4	30.0	45.6	31.0
18	49.9	31.2	47.3	29.7	44.3	30.7
19	* 50.1	* 31.1	47.0	30.0	45.1	31.1
20	50.4	31.0	45.9	30.3	* 45.6	* 31.0
21	50.3	30.6	47.5	30.3	46.1	30.8
22	49.8	30.4	48.8	30.2	46.2	31.2
23	49.6	30.8	48.3	30.7	46.1	31.1
24	49.7	30.7	48.0	30.6	45.2	31.2
25	49.9	30.2	* 47.8	* 30.8	46.9	31.1
26	50.2	30.2	47.5	31.1	46.2	31.2
27	49.9	30.2	47.0	30.8	46.2	31.5
28	49.1	30.3	46.4	30.7	46.2	31.4
29	49.1	30.4	46.2	30.8	45.6	31.2
30	49.0	30.3	46.0	30.8	45.6	31.2
31	48.5	30.6	0.0	0.0	45.1	31.5
MEANS	51.2	30.8	48.2	30.8	46.1	31.0
OBSVNS.	30	30	29	29	29	29
YRLY.MEANS....................................					48.1	31.1
MAXIMUM	54.4	31.2	50.2	31.6	47.3	31.5
MINIMUM	48.5	30.2	46.0	29.7	44.3	30.4
STD.DEV.	1.66	.38	1.27	.57	.67	.28

MCINNES ISLAND 52 15 48 N 128 43 10 W

	JANUARY		FEBRUARY		MARCH		1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL	
1	44.5	29.5	43.5	29.4	40.5	29.0	
2	43.9	29.3	43.7	29.3	40.4	29.1	
3	43.5	28.8	43.4	29.9	40.8	29.7	
4	43.8	29.0	43.2	30.0	41.5	29.7	
5	44.4	30.0	43.3	30.2	41.8	30.0	
6	43.0	30.2	43.3	30.2	42.0	29.9	
7	42.5	29.7	43.0	30.0	42.3	30.0	
8	42.8	29.7	43.9	31.1	42.3	30.3	
9	43.1	29.9	43.7	31.1	42.3	30.3	
10	42.9	30.0	43.7	30.8	42.2	30.2	
11	42.9	30.0	43.6	31.0	41.7	30.2	
12	42.9	30.0	43.5	30.7	42.4	30.3	
13	41.8	29.7	42.8	30.2	42.5	30.7	
14	42.5	29.7	42.8	30.2	42.5	30.4	
15	43.9	30.2	43.3	30.3	42.5	30.6	
16	44.9	30.8	43.8	30.4	42.9	30.4	
17	44.7	31.1	43.2	29.9	43.1	30.6	
18	42.7	29.7	43.6	30.4	43.0	30.8	
19	42.9	29.9	43.4	29.9	42.9	30.6	
20	43.2	29.3	43.6	30.4	* 43.0	* 30.7	
21	43.5	29.5	43.7	30.4	43.1	30.8	
22	44.3	30.7	43.5	30.3	43.2	31.1	
23	44.0	30.7	43.6	30.4	43.5	31.2	
24	44.4	30.8	42.9	29.9	43.4	31.2	
25	43.5	30.0	42.5	29.9	43.0	31.1	
26	44.6	31.4	42.2	29.4	43.0	31.1	
27	44.8	31.2	41.3	28.9	43.0	30.8	
28	44.5	30.7	40.8	29.1	42.8	30.6	
29	44.4	30.8	41.0	29.4	42.7	30.3	
30	44.0	30.6	0.0	0.0	43.5	30.8	
31	44.0	30.2	0.0	0.0	43.3	30.4	
MEANS	43.6	30.1	43.1	30.1	42.5	30.4	
OBSVNS.	31	31	29	29	30	30	
MAXIMUM	44.9	31.4	43.9	31.1	43.5	31.2	
MINIMUM	41.8	28.8	40.8	28.9	40.4	29.0	
STD.DEV.	.81	.65	.82	.57	.83	.56	

MCINNES ISLAND 52 15 48 N 128 43 10 W

	APRIL		MAY		JUNE		1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL	
1	43.4	30.2	47.0	29.7	49.1	27.8	
2	43.6	30.2	46.5	30.0	48.3	29.8	
3	43.3	29.8	46.3	29.9	50.1	28.8	
4	43.2	30.3	46.6	30.0	50.5	28.4	
5	43.6	30.2	46.2	30.4	50.3	28.6	
6	44.1	30.0	45.5	30.8	48.5	28.9	
7	44.2	29.8	47.0	30.7	50.2	28.8	
8	44.4	30.3	46.9	30.4	50.6	28.5	
9	43.9	29.7	47.4	30.4	49.1	28.9	
10	45.0	28.8	46.7	30.4	49.6	29.1	
11	44.2	29.5	46.0	30.4	48.6	29.1	
12	45.0	29.5	46.5	30.6	50.4	29.4	
13	45.0	29.8	45.8	30.6	51.5	27.4	
14	44.9	30.3	47.2	30.0	50.0	30.6	
15	44.4	30.3	47.7	30.0	49.7	29.9	
16	44.6	30.3	47.4	29.7	51.5	28.5	
17	44.7	30.2	47.9	29.7	52.5	27.6	
18	44.5	30.6	47.2	29.8	52.5	28.8	
19	44.7	30.6	48.2	29.8	52.7	28.2	
20	45.0	30.6	47.7	29.8	50.7	28.9	
21	44.7	30.7	47.3	29.9	50.5	28.9	
22	44.4	30.4	47.2	29.7	51.3	28.4	
23	44.9	30.6	47.8	29.7	51.4	29.1	
24	44.5	30.8	48.2	29.4	51.6	29.3	
25	44.7	30.8	48.0	29.8	50.5	28.6	
26	45.3	30.7	48.0	30.2	53.2	28.4	
27	46.3	29.9	47.6	30.7	53.5	27.8	
28	46.4	30.0	47.5	30.7	53.8	27.8	
29	47.7	29.0	47.6	30.3	54.0	27.2	
30	46.8	29.8	47.8	28.1	54.9	27.1	
31	0.0	0.0	49.3	28.2	0.0	0.0	
MEANS	44.7	30.1	47.3	30.0	51.0	28.6	
OBSVNS.	30	30	31	31	30	30	
MAXIMUM	47.7	30.8	49.3	30.8	54.9	30.6	
MINIMUM	43.2	28.8	45.0	28.1	48.3	27.1	
STD.DEV.	1.01	.50	.71	.62	1.72	.80	

MCINNES ISLAND 52 15 48 N 128 43 10 W

	JULY		AUGUST		SEPTEMBER 1976	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	54.7	28.0	57.6	27.1	56.5	26.5
2	52.9	27.8	54.2	28.4	* 56.0	* 28.0
3	55.0	26.0	54.2	29.8	55.5	29.5
4	54.0	27.3	53.6	28.5	54.3	29.4
5	51.9	28.1	53.5	28.8	56.0	29.1
6	52.3	28.8	55.2	28.0	54.9	29.3
7	55.2	27.3	54.3	28.5	55.9	28.0
8	54.9	27.6	53.8	28.6	55.2	25.1
9	54.2	29.8	54.1	28.5	55.3	25.4
10	54.0	28.0	53.8	29.1	55.5	23.8
11	54.7	27.7	57.5	29.3	56.9	25.9
12	55.7	28.0	53.5	29.0	54.1	27.8
13	55.0	28.4	53.6	29.3	54.5	28.5
14	56.4	27.4	57.2	28.5	53.9	28.8
15	57.0	27.4	56.3	28.0	55.1	28.2
16	57.2	27.4	57.5	28.0	54.1	28.8
17	57.0	28.6	58.4	28.4	53.7	28.1
18	55.6	28.4	56.0	28.2	54.3	27.7
19	56.7	27.6	54.5	30.3	54.0	27.7
20	56.0	27.7	53.5	29.8	54.2	26.8
21	54.4	28.4	53.3	28.8	53.4	27.1
22	53.2	28.5	55.7	28.2	53.8	26.9
23	54.6	28.8	56.2	22.4	53.4	27.4
24	54.9	29.5	55.8	24.0	54.0	27.4
25	54.8	28.5	56.2	29.4	53.2	28.4
26	54.5	29.1	54.7	28.0	53.0	28.2
27	55.5	28.5	55.5	29.3	54.6	27.4
28	56.2	28.5	55.8	27.3	53.0	29.1
29	56.8	27.6	55.5	25.4	52.2	29.5
30	57.4	27.7	55.7	28.0	52.9	29.5
31	55.4	27.7	57.1	25.5	0.0	0.0
MEANS	55.1	28.1	55.3	28.1	54.4	27.8
OBSVNS.	31	31	31	31	29	29
MAXIMUM	57.4	29.8	58.4	30.3	56.9	29.5
MINIMUM	51.9	26.0	53.3	22.4	52.2	23.8
STD.DEV.	1.39	.74	1.48	1.69	1.14	1.43

MCINNES ISLAND 52 15 48 N 128 43 10 W

DATE	OCTOBER TEMP	OCTOBER SAL	NOVEMBER TEMP	NOVEMBER SAL	DECEMBER 1976 TEMP	DECEMBER 1976 SAL
1	51.7	29.1	50.5	30.4	44.6	28.6
2	52.7	29.1	50.4	30.3	44.9	29.1
3	52.5	29.4	50.0	29.7	44.5	27.8
4	52.7	29.7	49.4	29.3	43.8	28.8
5	52.6	29.4	49.5	28.2	44.8	29.3
6	53.5	30.3	49.2	28.6	47.4	28.9
7	53.5	30.2	48.5	27.7	47.4	28.9
8	53.0	29.0	47.8	28.4	* 46.9	* 29.3
9	53.0	29.3	47.6	28.8	46.3	29.8
10	53.0	29.0	47.7	28.4	47.5	30.2
11	53.4	29.9	47.7	28.0	47.2	30.0
12	53.2	30.3	47.9	27.7	47.4	30.3
13	51.6	29.3	47.4	28.5	46.7	30.2
14	51.8	29.3	47.2	28.5	46.2	29.1
15	51.5	29.4	48.8	29.8	46.5	29.9
16	49.3	27.1	48.5	29.4	47.0	29.0
17	48.4	27.3	48.7	29.8	46.5	30.2
18	48.0	26.9	48.8	30.3	45.5	28.9
19	48.3	27.1	48.4	29.9	45.0	27.4
20	48.5	27.2	47.9	29.5	45.5	27.4
21	48.2	27.2	47.8	29.3	45.2	27.3
22	48.0	27.2	48.0	29.8	46.5	29.7
23	49.2	28.6	48.4	29.9	45.5	28.2
24	50.4	29.3	47.5	29.5	45.7	28.9
25	51.2	29.9	46.7	29.3	46.4	29.7
26	51.5	30.6	45.7	28.4	46.3	30.3
27	51.5	30.8	45.8	28.8	46.0	29.4
28	51.2	30.7	45.5	28.8	45.8	29.1
29	51.0	30.3	45.0	28.6	45.0	29.0
30	* 50.9	* 30.3	44.6	28.9	44.7	29.4
31	* 50.7	* 30.4	0.0	0.0	43.7	28.1
MEANS	51.2	29.1	47.8	29.1	45.8	29.1
OBSVNS.	29	29	30	30	30	30
YRLY.MEANS....................................					48.5	29.2
MAXIMUM	53.5	30.8	50.5	30.4	47.5	30.3
MINIMUM	48.0	26.9	44.6	27.7	43.7	27.3
STD.DEV.	1.89	1.23	1.44	.77	1.08	.88

CAPE ST JAMES 51 56 18 N 131 00 50 W

	JANUARY		FEBRUARY		MARCH	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.6	* 0.0	44.9	* 0.0	42.3	* 0.0
2	45.7	* 0.0	44.9	* 0.0	42.6	* 0.0
3	45.7	* 0.0	44.6	* 0.0	42.7	* 0.0
4	45.7	* 0.0	44.7	* 0.0	43.2	* 0.0
5	45.4	* 0.0	44.5	* 0.0	43.4	* 0.0
6	45.5	* 0.0	44.6	* 0.0	43.5	* 0.0
7	45.5	* 0.0	44.5	* 0.0	43.6	* 0.0
8	45.3	* 0.0	44.4	* 0.0	43.5	* 0.0
9	44.8	* 0.0	44.2	* 0.0	43.4	* 0.0
10	44.9	* 0.0	44.4	* 0.0	42.6	* 0.0
11	45.0	* 0.0	44.3	* 0.0	42.9	* 0.0
12	44.8	* 0.0	44.3	* 0.0	42.9	* 0.0
13	44.9	* 0.0	44.2	* 0.0	43.4	* 0.0
14	45.0	* 0.0	44.1	* 0.0	42.9	* 0.0
15	45.1	* 0.0	44.0	* 0.0	43.2	* 0.0
16	45.3	* 0.0	44.2	* 0.0	43.7	* 0.0
17	44.9	* 0.0	44.3	* 0.0	43.7	* 0.0
18	44.9	* 0.0	44.2	* 0.0	43.7	* 0.0
19	45.1	* 0.0	44.0	* 0.0	43.1	* 0.0
20	45.1	* 0.0	44.2	* 0.0	43.3	* 0.0
21	45.2	* 0.0	44.2	* 0.0	* 43.3	* 0.0
22	44.8	* 0.0	43.8	* 0.0	* 43.3	* 0.0
23	44.7	* 0.0	43.6	* 0.0	* 43.3	* 0.0
24	44.5	* 0.0	43.5	* 0.0	* 43.3	* 0.0
25	44.6	* 0.0	42.9	* 0.0	43.2	* 0.0
26	45.2	* 0.0	43.3	* 0.0	44.0	* 0.0
27	45.0	* 0.0	43.3	* 0.0	43.1	* 0.0
28	45.0	* 0.0	42.7	* 0.0	43.1	* 0.0
29	45.0	* 0.0	42.7	* 0.0	43.6	* 0.0
30	45.0	* 0.0	0.0	0.0	43.7	* 0.0
31	45.0	* 0.0	0.0	0.0	43.7	* 0.0
MEANS	45.1	0.0	44.1	0.0	43.3	0.0
OBSVNS.	31	0	29	0	27	0
MAXIMUM	45.7	0.0	44.9	0.0	44.0	0.0
MINIMUM	44.5	0.0	42.7	0.0	42.3	0.0
STD.DEV.	.32	0.00	.60	0.00	.42	0.00

CAPE ST JAMES 51 56 18 N 131 00 50 W

	APRIL			MAY			JUNE		1976
DATE	TEMP		SAL	TEMP		SAL	TEMP		SAL
1	43.4	*	0.0	45.3	*	0.0	46.3	*	0.0
2	43.7	*	0.0	46.2	*	0.0	46.0	*	0.0
3	43.5	*	0.0	45.2	*	0.0	46.4	*	0.0
4	43.9	*	0.0	45.6	*	0.0	47.2	*	0.0
5	43.8	*	0.0	45.1	*	0.0	48.5	*	0.0
6	43.9	*	0.0	45.1	*	0.0	47.8	*	0.0
7	43.8	*	0.0	45.0	*	0.0	48.1	*	0.0
8	43.8	*	0.0	44.8	*	0.0	47.9	*	0.0
9	44.0	*	0.0	45.1	*	0.0	47.3	*	0.0
10	43.8	*	0.0	45.1	*	0.0	47.5	*	0.0
11	44.2	*	0.0	44.8	*	0.0	47.6	*	0.0
12	44.5	*	0.0	45.2	*	0.0	49.8	*	0.0
13	44.4	*	0.0	45.0	*	0.0	48.2	*	0.0
14	44.0	*	0.0	45.8	*	0.0	47.5	*	0.0
15	44.5	*	0.0	46.5	*	0.0	47.3	*	0.0
16	43.8	*	0.0	45.8	*	0.0	47.9	*	0.0
17	43.8	*	0.0	45.9	*	0.0	47.4	*	0.0
18	43.8	*	0.0	47.2	*	0.0	48.7	*	0.0
19	44.0	*	0.0	45.8	*	0.0	48.4	*	0.0
20	44.0	*	0.0	46.4	*	0.0	48.8	*	0.0
21	44.2	*	0.0	45.8	*	0.0	48.9	*	0.0
22	44.1	*	0.0	45.5	*	0.0	48.7	*	0.0
23	44.0	*	0.0	45.5	*	0.0	47.9	*	0.0
24	43.9	*	0.0	46.1	*	0.0	48.3	*	0.0
25	44.7	*	0.0	45.4	*	0.0	48.2	*	0.0
26	45.4	*	0.0	46.1	*	0.0	49.8	*	0.0
27	45.5	*	0.0	46.6	*	0.0	52.2	*	0.0
28	45.8	*	0.0	46.2	*	0.0	51.6	*	0.0
29	46.6	*	0.0	45.9	*	0.0	50.0	*	0.0
30	45.5	*	0.0	46.1	*	0.0	49.6	*	0.0
31	0.0		0.0	46.3	*	0.0	0.0		0.0
MEANS	44.3		0.0	45.7		0.0	48.3		0.0
OBSVNS.	30		0	31		0	30		0
MAXIMUM	46.6		0.0	47.2		0.0	52.2		0.0
MINIMUM	43.4		0.0	44.8		0.0	46.0		0.0
STD.DEV.	.77		0.00	.62		0.00	1.39		0.00

CAPE ST JAMES 51 56 18 N 131 00 50 W

	JULY		AUGUST		SEPTEMBER 1976	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	50.0	* 0.0	50.2	* 0.0	52.5	* 0.0
2	50.3	* 0.0	49.5	* 0.0	52.2	* 0.0
3	49.7	* 0.0	50.5	* 0.0	51.7	* 0.0
4	49.8	* 0.0	50.9	* 0.0	51.1	* 0.0
5	50.9	* 0.0	50.3	* 0.0	51.5	* 0.0
6	50.8	* 0.0	50.9	* 0.0	52.1	* 0.0
7	48.9	* 0.0	52.6	* 0.0	52.9	* 0.0
8	48.6	* 0.0	52.4	* 0.0	52.3	* 0.0
9	49.4	* 0.0	51.5	* 0.0	51.5	* 0.0
10	48.8	* 0.0	50.8	* 0.0	52.0	* 0.0
11	49.1	* 0.0	51.7	* 0.0	52.8	* 0.0
12	49.5	* 0.0	50.5	* 0.0	53.0	* 0.0
13	50.0	* 0.0	52.4	* 0.0	50.4	* 0.0
14	49.3	* 0.0	51.0	* 0.0	50.3	* 0.0
15	49.4	* 0.0	51.8	* 0.0	51.3	* 0.0
16	50.0	* 0.0	53.1	* 0.0	51.9	* 0.0
17	51.3	* 0.0	51.9	* 0.0	53.3	* 0.0
18	51.0	* 0.0	53.1	* 0.0	52.0	* 0.0
19	49.5	* 0.0	51.5	* 0.0	52.1	* 0.0
20	49.3	* 0.0	51.2	* 0.0	* 52.5	* 0.0
21	49.7	* 0.0	51.5	* 0.0	52.9	* 0.0
22	48.9	* 0.0	52.4	* 0.0	51.6	* 0.0
23	48.9	* 0.0	53.5	* 0.0	52.9	* 0.0
24	52.5	* 0.0	54.0	* 0.0	51.9	* 0.0
25	49.5	* 0.0	53.0	* 0.0	52.3	* 0.0
26	49.0	* 0.0	52.2	* 0.0	52.7	* 0.0
27	49.1	* 0.0	52.4	* 0.0	52.0	* 0.0
28	49.0	* 0.0	52.6	* 0.0	50.5	* 0.0
29	52.2	* 0.0	52.9	* 0.0	50.7	* 0.0
30	52.6	* 0.0	52.5	* 0.0	50.5	* 0.0
31	52.0	* 0.0	51.7	* 0.0	0.0	0.0
MEANS	50.0	0.0	51.8	0.0	51.9	0.0
OBSVNS.	31	0	31	0	29	0
MAXIMUM	52.6	0.0	54.0	0.0	53.3	0.0
MINIMUM	48.6	0.0	49.5	0.0	50.3	0.0
STD.DEV.	1.15	0.00	1.08	0.00	.65	0.00

CAPE ST JAMES 51 56 18 N 131 00 50 W

	OCTOBER		NOVEMBER		DECEMBER	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	52.7	* 0.0	48.2	* 0.0	48.5	* 0.0
2	51.5	* 0.0	* 48.0	* 0.0	48.0	* 0.0
3	51.7	* 0.0	* 47.8	* 0.0	47.9	* 0.0
4	51.2	* 0.0	47.5	* 0.0	47.8	* 0.0
5	51.5	* 0.0	47.5	* 0.0	48.1	* 0.0
6	51.8	* 0.0	48.4	* 0.0	48.1	* 0.0
7	51.9	* 0.0	48.5	* 0.0	48.0	* 0.0
8	52.2	* 0.0	48.3	* 0.0	47.4	* 0.0
9	51.2	* 0.0	49.1	* 0.0	47.8	* 0.0
10	51.6	* 0.0	49.2	* 0.0	47.9	* 0.0
11	51.3	* 0.0	49.3	* 0.0	47.8	* 0.0
12	51.0	* 0.0	49.5	* 0.0	48.2	* 0.0
13	50.3	* 0.0	49.4	* 0.0	* 48.1	* 0.0
14	51.2	* 0.0	48.3	* 0.0	* 48.0	* 0.0
15	51.4	* 0.0	* 48.3	* 0.0	47.8	* 0.0
16	51.1	* 0.0	48.3	* 0.0	* 47.4	* 0.0
17	50.9	* 0.0	47.9	* 0.0	47.0	* 0.0
18	50.4	* 0.0	48.0	* 0.0	46.8	* 0.0
19	50.5	* 0.0	47.8	* 0.0	* 46.8	* 0.0
20	51.3	* 0.0	48.0	* 0.0	46.8	* 0.0
21	50.8	* 0.0	47.6	* 0.0	47.5	* 0.0
22	51.0	* 0.0	48.3	* 0.0	46.7	* 0.0
23	51.5	* 0.0	48.4	* 0.0	46.7	* 0.0
24	50.5	* 0.0	48.1	* 0.0	* 46.7	* 0.0
25	49.2	* 0.0	48.0	* 0.0	* 46.6	* 0.0
26	50.2	* 0.0	* 48.0	* 0.0	46.6	* 0.0
27	49.1	* 0.0	48.1	* 0.0	47.3	* 0.0
28	49.0	* 0.0	48.3	* 0.0	* 47.1	* 0.0
29	49.5	* 0.0	48.2	* 0.0	* 46.9	* 0.0
30	49.1	* 0.0	47.7	* 0.0	46.7	* 0.0
31	48.1	* 0.0	0.0	0.0	46.8	* 0.0
MEANS	50.8	0.0	48.3	0.0	47.5	0.0
OBSVNS.	31	0	26	0	23	0
YRLY.MEANS..					47.6	0.0
MAXIMUM	52.7	0.0	49.5	0.0	48.5	0.0
MINIMUM	48.1	0.0	47.5	0.0	46.6	0.0
STD.DEV.	1.06	0.00	.57	0.00	.63	0.00

EGG ISLAND 51 15 06 N 127 49 53 W

	JANUARY		FEBRUARY		MARCH	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.2	30.8	44.5	30.7	42.8	30.7
2	44.1	30.8	44.8	30.3	41.8	30.6
3	44.5	30.8	43.9	30.3	41.7	30.6
4	45.0	30.8	43.5	30.2	42.7	30.7
5	44.6	31.1	42.5	30.2	42.8	30.7
6	44.8	31.1	42.9	30.4	42.7	31.0
7	44.9	30.8	44.0	30.4	43.2	30.7
8	45.4	30.6	43.0	30.4	43.9	30.8
9	43.2	30.6	43.1	30.2	43.5	30.4
10	42.9	30.6	41.6	30.4	* 43.5	* 30.4
11	44.1	30.6	43.9	30.8	43.5	30.4
12	43.7	30.6	44.9	30.6	43.2	30.4
13	42.9	30.4	42.5	30.6	43.1	30.7
14	43.6	30.8	43.9	30.6	43.9	31.1
15	44.2	30.8	43.7	30.6	43.7	31.6
16	45.2	30.7	44.2	30.8	45.5	30.8
17	45.1	30.6	44.3	30.8	44.9	30.6
18	44.6	30.6	44.3	30.6	43.9	31.1
19	44.5	30.8	43.9	30.4	44.2	30.6
20	44.4	30.8	43.1	30.7	44.9	31.1
21	44.2	30.8	44.2	30.8	44.6	30.8
22	44.2	30.6	43.7	30.7	43.9	30.6
23	44.1	30.6	43.9	30.6	43.1	30.4
24	44.0	30.6	41.7	30.6	43.0	30.4
25	43.2	30.7	42.6	31.0	43.6	30.7
26	44.5	30.8	43.1	31.0	43.8	30.8
27	44.8	30.6	43.0	30.7	43.9	30.8
28	45.0	30.6	43.3	30.8	44.2	30.8
29	44.9	30.6	42.0	31.0	44.4	31.1
30	44.8	30.6	0.0	0.0	44.8	30.9
31	44.2	31.1	0.0	0.0	44.9	30.8
MEANS	44.3	30.7	43.4	30.6	43.7	30.8
OBSVNS.	31	31	29	29	30	30
MAXIMUM	45.4	31.1	44.9	31.0	45.5	31.6
MINIMUM	42.9	30.4	41.6	30.2	41.7	30.4
STD.DEV.	.65	.16	.87	.24	.91	.26

EGG ISLAND 51 15 06 N 127 49 53 W

	APRIL		MAY		JUNE	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.7	30.6	* 50.2	* 30.3	* 0.0	* 0.0
2	46.2	31.1	50.1	30.0	* 0.0	* 0.0
3	45.2	31.1	48.9	30.3	* 0.0	* 0.0
4	45.1	30.8	* 0.0	* 0.0	* 0.0	* 0.0
5	45.5	30.7	* 0.0	* 0.0	* 0.0	* 0.0
6	45.4	30.6	* 0.0	* 0.0	* 0.0	* 0.0
7	45.3	30.3	48.9	30.6	* 0.0	* 0.0
8	45.5	30.4	48.1	29.9	* 0.0	* 0.0
9	45.8	31.0	48.2	30.0	* 0.0	* 0.0
10	45.6	31.0	48.0	30.8	* 0.0	* 0.0
11	45.1	30.3	47.2	31.0	* 0.0	* 0.0
12	46.8	30.4	* 47.8	* 30.8	* 0.0	* 0.0
13	46.5	30.4	* 48.4	* 30.6	* 0.0	* 0.0
14	45.1	30.6	49.1	30.3	* 0.0	* 0.0
15	46.0	30.7	* 0.0	* 0.0	* 0.0	* 0.0
16	46.1	31.0	* 0.0	* 0.0	55.0	27.6
17	46.3	30.7	* 0.0	* 0.0	54.8	28.6
18	46.9	31.0	* 0.0	* 0.0	53.2	23.7
19	46.0	30.7	47.8	30.2	54.0	21.8
20	46.1	30.4	49.0	30.3	54.3	22.0
21	46.1	30.7	49.1	30.3	50.2	27.7
22	46.3	30.7	48.0	28.1	50.6	28.0
23	45.5	31.2	50.0	26.9	52.3	26.4
24	45.9	31.2	48.9	28.1	53.5	27.3
25	44.8	31.1	48.1	30.0	52.2	21.7
26	47.0	31.0	* 48.1	* 30.3	55.4	19.6
27	48.7	30.8	48.2	30.7	57.2	23.8
28	49.1	30.6	* 48.3	* 30.7	58.1	20.5
29	* 49.7	* 30.6	* 48.4	* 30.6	58.8	20.3
30	50.3	30.6	48.5	30.6	59.2	20.3
31	0.0	0.0	49.6	30.6	0.0	0.0
MEANS	46.2	30.7	48.6	29.9	54.6	24.0
OBSVNS.	29	29	18	18	15	15
MAXIMUM	50.3	31.2	50.1	31.0	59.2	28.6
MINIMUM	44.8	30.3	47.2	26.9	50.2	19.6
STD.DEV.	1.25	.27	.78	1.09	2.79	3.71

EGG ISLAND 51 15 06 N 127 49 53 W

	JULY		AUGUST		SEPTEMBER 1976	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	58.0	21.6	55.9	24.2	53.4	30.0
2	56.2	21.3	56.5	22.5	53.1	30.3
3	54.5	24.6	55.9	22.6	51.3	30.2
4	55.4	25.5	54.6	22.2	51.7	30.4
5	59.5	23.4	54.1	23.8	52.4	29.7
6	56.1	23.4	52.9	27.2	53.4	29.8
7	53.9	27.7	54.4	27.7	55.9	28.9
8	53.2	28.0	55.2	28.8	55.6	28.9
9	53.4	28.6	56.5	26.5	55.8	26.3
10	51.9	30.3	55.9	27.6	55.0	26.7
11	50.9	30.0	55.8	27.6	54.6	27.2
12	51.4	31.0	56.9	27.6	52.9	28.6
13	52.8	29.8	54.4	28.6	51.6	28.4
14	55.7	30.0	57.5	22.6	51.4	28.9
15	55.5	30.6	55.9	25.0	51.8	29.7
16	* 55.1	* 30.5	57.2	24.6	* 51.8	* 30.4
17	54.7	30.4	57.1	23.8	51.9	31.2
18	54.4	28.1	56.6	23.7	51.7	30.3
19	53.8	30.4	54.4	28.8	50.9	30.7
20	53.1	30.4	51.4	30.2	52.9	29.9
21	51.7	29.9	51.2	29.8	53.2	29.9
22	52.7	30.6	53.6	29.8	53.2	29.9
23	53.1	30.6	51.9	28.6	54.4	29.9
24	52.8	30.0	52.6	29.8	56.1	29.5
25	52.5	29.5	53.5	29.9	52.9	30.3
26	53.1	29.7	53.2	29.8	53.3	29.9
27	53.6	29.7	51.1	29.7	53.0	30.3
28	55.9	22.4	52.4	29.8	51.2	31.0
29	55.9	26.8	52.9	29.3	51.4	31.2
30	57.0	24.9	52.7	29.9	51.7	31.1
31	55.4	25.5	53.8	30.2	0.0	0.0
MEANS	54.3	27.8	54.5	27.2	53.0	29.6
OBSVNS.	30	30	31	31	29	29
MAXIMUM	59.5	31.0	57.5	30.2	56.1	31.2
MINIMUM	50.9	21.3	51.1	22.2	50.9	26.3
STD.DEV.	2.06	3.07	1.98	2.78	1.55	1.23

EGG ISLAND 51 15 06 N 127 49 53 W

	OCTOBER		NOVEMBER		DECEMBER	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	52.4	31.1	47.3	31.0	44.8	30.4
2	* 52.5	* 31.1	47.7	31.1	45.8	30.4
3	52.7	31.1	49.3	31.5	45.4	30.4
4	51.5	30.7	48.2	31.1	45.6	30.4
5	50.9	30.0	47.3	31.1	45.5	30.7
6	53.0	30.2	47.7	30.8	45.7	30.4
7	52.6	29.8	48.4	30.8	46.4	29.8
8	52.2	28.9	48.6	29.7	44.2	29.8
9	52.8	28.9	48.7	30.0	44.8	29.8
10	52.5	28.0	48.4	30.8	* 45.6	* 30.4
11	52.1	28.1	49.1	30.6	46.5	31.0
12	51.8	29.0	48.0	30.6	46.9	30.2
13	50.5	29.8	48.1	30.8	46.4	30.2
14	49.1	31.1	48.0	30.8	46.0	30.4
15	49.4	28.8	47.9	31.1	46.3	30.4
16	49.0	29.8	47.3	31.1	47.6	30.6
17	48.8	29.8	47.1	31.0	45.4	30.4
18	48.6	30.0	46.7	31.0	43.9	29.5
19	48.3	30.2	* 47.0	* 31.2	44.4	30.3
20	49.4	30.3	47.4	31.4	45.2	30.6
21	47.8	28.6	47.7	31.4	46.6	30.7
22	48.4	31.0	47.9	31.1	46.6	31.2
23	48.2	30.8	48.4	30.8	45.7	31.2
24	49.0	31.0	48.3	31.1	45.1	31.0
25	49.4	31.1	46.7	30.7	* 45.1	* 30.8
26	49.2	31.0	45.3	30.7	45.0	30.6
27	48.5	30.8	45.0	30.6	45.4	30.7
28	48.3	31.1	45.1	30.7	45.6	30.7
29	48.1	31.1	44.8	30.3	46.4	30.4
30	47.8	31.1	44.3	30.3	45.0	30.4
31	47.5	31.1	0.0	0.0	43.4	30.3
MEANS	50.0	30.1	47.4	30.8	45.6	30.4
OBSVNS.	30	30	29	29	29	29
YRLY.MEANS					48.6	29.6
MAXIMUM	53.0	31.1	49.3	31.5	47.6	31.2
MINIMUM	47.5	28.0	44.3	29.7	43.4	29.5
STD.DEV.	1.86	.99	1.32	.40	.94	.40

PINE ISLAND 50 58 33 N 127 43 35 W

	JANUARY		FEBRUARY		MARCH	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.3	31.0	44.8	30.6	43.8	30.4
2	45.5	30.8	44.8	30.3	43.6	30.4
3	45.0	30.8	45.0	30.6	43.7	30.7
4	45.0	30.7	44.5	30.4	44.0	30.4
5	45.0	30.6	44.8	30.4	44.0	30.4
6	44.7	30.6	44.7	30.3	43.8	30.7
7	44.4	30.7	44.1	30.3	43.8	30.4
8	44.7	30.7	44.2	30.3	43.8	30.4
9	44.4	30.4	44.0	30.3	44.0	30.2
10	44.5	30.4	44.2	30.4	44.2	30.4
11	44.5	30.7	44.0	30.4	44.1	30.4
12	44.5	30.4	44.5	31.0	44.2	30.7
13	44.0	31.0	44.5	30.8	44.2	30.4
14	44.0	30.7	44.5	31.0	44.0	30.7
15	44.5	30.4	44.5	30.8	44.2	30.7
16	45.0	30.8	44.3	30.6	44.0	30.8
17	44.5	30.6	44.0	30.2	44.1	30.8
18	45.0	30.7	44.3	30.4	44.1	31.1
19	44.8	30.6	44.4	30.6	44.0	31.2
20	44.9	30.4	44.0	30.7	44.1	31.0
21	44.7	30.4	44.0	30.4	43.8	31.2
22	44.6	30.6	44.1	30.4	43.8	30.8
23	44.5	30.6	44.0	30.7	43.7	31.1
24	44.6	30.6	44.0	30.4	44.0	31.0
25	44.5	30.6	44.0	30.4	44.0	31.2
26	44.5	30.6	44.2	30.7	44.0	31.0
27	44.6	30.8	44.2	30.4	44.2	30.8
28	44.5	30.9	44.2	30.7	44.2	31.0
29	44.5	30.6	44.2	30.4	44.4	31.0
30	44.6	30.8	0.0	0.0	44.5	30.7
31	44.7	30.6	0.0	0.0	44.5	30.8
MEANS	44.7	30.6	44.3	30.5	44.0	30.7
OBSVNS.	31	31	29	29	31	31
MAXIMUM	45.5	31.0	45.0	31.0	44.5	31.2
MINIMUM	44.0	30.4	44.0	30.2	43.6	30.2
STD.DEV.	.32	.16	.30	.21	.22	.29

PINE ISLAND 50 58 33 N 127 43 35 W

	APRIL		MAY		JUNE	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.5	31.0	46.0	31.5	47.5	30.8
2	44.5	31.0	46.0	31.6	46.8	31.0
3	44.6	31.1	45.4	31.2	47.5	31.1
4	44.5	31.1	45.6	31.4	47.7	31.1
5	45.0	31.4	46.0	31.1	47.7	30.8
6	45.0	31.1	46.0	31.4	47.0	30.8
7	45.0	31.1	46.3	31.1	47.1	30.7
8	45.2	31.0	46.0	31.4	47.7	31.0
9	45.2	31.1	46.2	30.8	47.2	30.7
10	45.0	31.1	46.5	31.0	47.2	31.1
11	45.3	30.8	46.0	31.1	47.0	31.1
12	45.0	31.1	45.4	31.4	47.1	31.0
13	45.0	31.4	46.1	31.4	47.2	31.2
14	45.2	31.1	46.5	31.5	47.1	31.1
15	45.3	31.0	46.0	31.4	47.2	31.4
16	45.0	30.8	46.2	31.1	47.0	31.2
17	45.2	31.1	46.0	31.4	47.3	31.1
18	45.0	31.2	46.3	31.5	47.4	31.4
19	45.2	31.4	46.5	31.5	47.6	31.1
20	45.0	31.4	46.7	31.2	47.5	31.1
21	46.1	31.1	46.3	31.5	47.4	31.4
22	46.2	31.0	46.5	31.2	47.5	31.2
23	46.0	31.1	45.4	31.2	48.0	30.6
24	44.8	31.1	46.8	30.8	48.2	30.8
25	44.6	31.1	46.3	30.7	48.3	31.1
26	45.0	31.4	46.6	30.8	49.0	31.5
27	45.2	31.1	46.3	31.1	49.4	31.1
28	45.0	31.4	46.3	31.6	49.4	31.2
29	46.2	31.5	46.8	31.2	47.7	31.1
30	46.0	31.4	46.5	31.1	47.5	31.0
31	0.0	0.0	* 47.0	* 31.0	0.0	0.0
MEANS	45.2	31.1	46.2	31.2	47.6	31.1
OBSVNS.	30	30	30	30	30	30
MAXIMUM	46.2	31.5	46.8	31.6	49.4	31.5
MINIMUM	44.5	30.8	45.4	30.7	46.8	30.6
STD.DEV.	.49	.18	.35	.25	.66	.22

PINE ISLAND 50 58 33 N 127 43 35 W

	JULY		AUGUST		SEPTEMBER 1976	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	47.5	31.1	49.4	30.8	49.0	31.1
2	47.0	29.4	49.4	30.7	49.3	30.7
3	47.5	31.0	49.3	30.7	49.2	31.0
4	47.5	30.8	49.0	31.1	48.2	30.6
5	47.5	30.8	49.0	30.8	48.3	30.8
6	47.6	31.0	49.2	30.8	49.4	31.4
7	47.4	30.8	49.1	30.8	49.4	31.2
8	47.4	31.1	49.0	31.4	49.7	31.2
9	47.6	31.1	49.2	31.1	49.0	30.8
10	48.0	31.2	49.0	31.1	49.0	31.0
11	49.0	31.1	48.8	31.2	48.2	31.2
12	49.1	31.2	48.4	31.1	48.3	31.1
13	48.4	31.2	48.8	31.1	48.5	31.1
14	50.0	31.0	49.4	30.8	49.3	30.7
15	* 49.5	* 31.2	49.7	31.0	50.5	31.2
16	49.0	31.4	49.0	31.0	49.1	31.0
17	49.3	31.0	49.0	30.6	49.4	31.1
18	49.2	30.7	51.1	30.3	50.2	31.0
19	49.1	30.7	49.5	30.8	50.1	31.2
20	49.1	31.0	49.4	31.1	49.0	31.2
21	48.3	30.8	49.6	31.1	49.1	31.0
22	48.0	31.0	49.3	30.8	49.0	31.2
23	48.0	30.8	49.0	31.1	49.1	31.0
24	48.2	31.1	49.2	31.1	49.4	31.5
25	48.6	31.2	49.0	31.0	49.6	31.6
26	48.7	31.1	48.5	30.6	49.5	31.4
27	50.0	30.4	48.4	30.8	49.0	31.2
28	49.5	30.4	49.3	30.8	50.0	31.0
29	50.0	30.7	49.0	30.7	49.4	31.0
30	50.5	30.7	49.0	30.7	50.0	31.4
31	49.5	30.8	48.5	31.0	0.0	0.0
MEANS	48.5	30.9	49.1	30.9	49.2	31.1
OBSVNS.	30	30	31	31	30	30
MAXIMUM	50.5	31.4	51.1	31.4	50.5	31.6
MINIMUM	47.0	29.4	48.3	30.3	48.2	30.6
STD.DEV.	.96	.37	.50	.23	.58	.23

PINE ISLAND 50 58 33 N 127 43 35 W

DATE	OCTOBER TEMP	OCTOBER SAL	NOVEMBER TEMP	NOVEMBER SAL	DECEMBER 1976 TEMP	DECEMBER 1976 SAL
1	49.5	31.5	49.5	31.6	47.0	31.4
2	49.0	31.2	50.0	31.6	46.5	31.2
3	49.3	31.4	49.3	31.9	47.0	31.0
4	49.0	31.2	49.7	31.6	47.0	31.2
5	48.7	31.1	49.5	31.6	47.0	31.2
6	48.4	31.1	48.5	31.6	47.0	31.0
7	46.6	31.4	49.6	31.6	47.2	31.2
8	48.3	31.4	48.4	31.9	47.2	31.2
9	48.4	31.1	48.2	31.6	46.1	31.2
10	49.5	31.5	48.3	31.4	46.3	31.2
11	50.0	31.4	48.5	31.6	46.3	31.2
12	49.2	31.0	48.5	31.4	46.7	31.2
13	49.5	31.5	48.4	31.2	46.7	31.2
14	49.1	31.5	48.5	31.4	46.5	31.0
15	49.4	31.5	48.4	31.4	47.0	31.0
16	49.2	31.4	48.4	31.4	47.1	30.7
17	49.2	31.5	49.7	31.4	47.0	30.8
18	48.0	31.1	49.0	31.6	47.4	30.7
19	48.0	31.4	49.2	31.4	47.0	31.0
20	48.0	31.6	48.3	31.6	47.0	31.2
21	48.1	31.9	48.3	31.1	47.3	31.2
22	48.2	31.6	48.5	31.4	46.3	31.0
23	48.2	31.4	48.5	31.4	46.4	31.2
24	47.4	31.6	48.0	31.4	46.5	31.2
25	48.1	31.6	47.3	31.4	46.5	31.2
26	48.3	31.6	47.4	31.1	46.4	31.5
27	49.1	31.4	47.3	31.4	46.4	31.5
28	51.0	31.8	47.1	31.4	46.7	31.2
29	50.2	31.6	47.0	31.4	46.5	31.0
30	50.0	31.4	47.0	31.1	46.5	31.2
31	50.0	31.4	0.0	0.0	46.5	31.2
MEANS	48.9	31.4	48.4	31.5	46.7	31.1
OBSVNS.	31	31	30	30	31	31
YRLY.MEANS					46.9	31.0
MAXIMUM	51.0	31.9	50.0	31.9	47.4	31.5
MINIMUM	47.4	31.0	47.0	31.1	46.1	30.7
STD.DEV.	.81	.21	.82	.19	.35	.19

KAINS ISLAND 50 26 39 N 128 01 47 W

DATE	JANUARY TEMP	JANUARY SAL	FEBRUARY TEMP	FEBRUARY SAL	MARCH TEMP	MARCH SAL
						1976
1	45.6	29.1	45.6	28.9	44.4	29.8
2	46.0	29.7	45.6	29.1	43.7	29.7
3	45.9	29.8	45.2	29.1	43.7	29.8
4	46.0	29.7	45.0	29.4	44.7	30.0
5	45.6	29.0	44.4	29.8	44.8	29.9
6	45.0	29.1	44.6	29.3	45.0	29.9
7	45.2	28.6	44.8	29.4	44.7	29.8
8	44.9	28.5	44.6	29.7	45.0	29.4
9	44.2	27.6	44.4	29.8	45.5	29.5
10	43.5	28.6	44.5	29.8	44.7	29.8
11	43.9	28.4	44.2	26.1	45.2	29.1
12	44.0	28.1	42.8	25.5	44.9	29.4
13	44.0	28.6	44.4	29.8	44.6	29.4
14	43.4	29.3	44.3	28.9	45.2	29.4
15	43.8	28.1	44.8	28.9	45.4	30.2
16	45.7	28.8	44.5	29.3	45.2	30.3
17	45.5	28.4	44.4	30.0	45.1	30.4
18	45.2	28.8	44.8	29.7	45.6	29.7
19	45.2	28.4	44.7	29.3	45.8	29.9
20	44.8	28.9	44.8	29.0	45.1	30.2
21	45.6	29.1	44.8	28.6	45.1	30.3
22	45.2	29.4	44.9	28.0	45.0	29.7
23	44.8	29.4	44.5	28.9	45.1	29.8
24	45.0	28.8	44.3	29.0	44.4	29.8
25	45.2	29.0	43.2	28.2	44.7	29.9
26	45.6	28.8	43.3	27.6	44.6	29.9
27	45.5	28.9	43.5	27.8	44.8	29.5
28	45.7	29.5	44.1	29.3	44.8	29.0
29	45.2	28.6	43.6	29.4	45.1	29.5
30	45.1	28.5	0.0	0.0	45.1	29.4
31	45.2	29.0	0.0	0.0	45.4	28.8
MEANS	45.0	28.9	44.4	28.9	44.9	29.7
OBSVNS.	31	31	29	29	31	31
MAXIMUM	46.0	29.8	45.6	30.0	45.8	30.4
MINIMUM	43.4	27.6	42.8	25.5	43.7	28.8
STD.DEV.	.72	.59	.65	1.05	.46	.38

KAINS ISLAND 50 26 39 N 128 01 47 W

	APRIL		MAY		JUNE	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.8	28.9	48.6	30.0	49.8	28.8
2	46.1	29.3	49.0	29.9	49.9	28.8
3	45.6	29.1	48.8	29.8	50.3	28.6
4	46.0	29.3	48.9	29.7	51.3	29.1
5	45.7	29.1	49.0	29.9	51.2	29.1
6	46.4	29.8	48.7	29.8	52.6	29.5
7	46.2	29.1	49.4	29.5	52.9	29.5
8	45.7	29.3	49.7	30.0	51.4	30.3
9	47.2	29.0	48.6	30.0	51.0	31.0
10	46.7	28.9	49.2	30.3	50.9	29.8
11	46.7	29.0	49.1	30.6	50.5	30.2
12	47.0	29.5	49.1	30.6	52.2	29.9
13	47.2	29.7	49.2	28.9	50.8	30.0
14	46.3	29.8	49.1	30.0	50.7	30.3
15	46.1	29.9	49.2	30.4	51.1	30.0
16	45.9	29.9	47.9	30.6	51.6	30.2
17	46.7	29.9	49.6	30.6	51.0	30.0
18	47.2	29.8	50.1	29.5	50.7	29.9
19	46.8	29.8	50.3	29.7	50.9	30.2
20	47.7	30.0	49.3	30.2	51.4	30.4
21	47.0	29.8	50.2	30.0	51.9	29.8
22	47.0	29.9	50.6	29.8	51.7	30.3
23	46.7	29.3	50.8	29.9	51.4	30.0
24	46.7	29.9	50.6	30.6	52.8	30.6
25	47.7	29.7	49.6	30.7	51.9	30.3
26	47.3	29.7	50.2	29.9	51.2	30.7
27	47.7	29.9	50.0	30.4	51.0	30.4
28	48.0	30.0	50.7	29.8	52.1	30.6
29	49.6	30.3	49.6	28.6	51.6	30.3
30	48.9	30.0	49.9	29.0	51.8	30.7
31	0.0	0.0	50.0	30.0	0.0	0.0
MEANS	46.9	29.6	49.5	30.0	51.3	30.[illegible]
OBSVNS.	30	30	31	31	30	30
MAXIMUM	49.6	30.3	50.8	30.7	52.9	31.0
MINIMUM	44.8	28.9	47.9	28.6	49.8	28.6
STD.DEV.	.93	.40	.71	.51	.76	.61

KAINS ISLAND 50 26 39 N 128 01 47 W

	JULY		AUGUST		SEPTEMBER 1976	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	52.3	30.8	53.6	31.2	57.7	31.1
2	52.3	31.0	54.7	31.4	56.5	31.2
3	52.1	31.1	55.9	31.4	57.1	31.1
4	53.2	30.8	55.2	30.8	56.9	31.0
5	53.5	30.3	54.3	31.2	57.6	30.3
6	54.1	31.2	53.2	31.5	57.4	30.6
7	54.7	31.1	52.3	31.5	57.0	30.0
8	54.4	31.2	52.9	31.4	57.5	30.2
9	54.6	30.6	52.4	31.8	58.1	30.4
10	55.5	30.6	53.7	31.8	58.0	30.3
11	55.4	30.4	52.8	31.8	56.2	30.4
12	55.6	30.7	53.9	31.9	56.6	31.0
13	55.1	30.6	54.2	32.3	56.8	31.6
14	56.2	31.1	55.1	31.5	56.5	30.8
15	56.7	31.0	56.7	32.0	57.2	30.8
16	55.1	30.8	55.2	32.0	57.2	30.6
17	54.9	30.8	55.0	32.5	56.8	30.8
18	53.7	30.7	55.6	32.0	55.7	30.7
19	52.8	30.7	55.9	32.1	54.9	30.7
20	52.8	30.8	55.6	31.9	55.2	31.0
21	53.4	30.8	55.9	30.2	55.7	30.7
22	53.8	31.2	56.8	30.2	56.2	31.0
23	54.4	30.3	57.4	31.1	56.7	31.0
24	55.2	30.2	56.4	31.5	57.2	31.2
25	54.6	30.4	57.0	31.8	56.7	31.0
26	55.0	30.8	56.4	31.4	56.8	31.2
27	54.8	31.0	56.4	31.1	56.9	31.4
28	53.2	31.2	55.9	31.2	56.7	31.2
29	55.1	31.0	57.4	31.0	56.6	31.1
30	53.6	31.2	56.7	31.2	56.6	31.1
31	53.3	31.2	57.9	30.7	0.0	0.0
MEANS	54.2	30.8	55.3	31.5	56.8	30.9
OBSVNS.	31	31	31	31	30	30
MAXIMUM	56.7	31.2	57.9	32.5	58.1	31.6
MINIMUM	52.1	30.2	52.3	30.2	54.9	30.0
STD.DEV.	1.17	.30	1.60	.54	.74	.38

KAINS ISLAND 50 26 39 N 128 01 47 W

	OCTOBER		NOVEMBER		DECEMBER 1976	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	55.8	31.1	51.6	31.0	47.6	29.7
2	55.6	31.1	50.8	29.8	48.2	29.8
3	55.4	31.1	52.1	30.6	47.8	29.9
4	54.1	31.0	51.7	29.5	48.0	29.8
5	54.8	31.0	49.7	29.7	48.4	29.9
6	55.3	31.1	50.0	29.7	49.2	30.3
7	54.7	30.6	50.6	30.2	48.9	30.3
8	55.1	31.0	50.0	29.9	47.9	28.8
9	55.6	30.8	51.1	30.2	48.4	28.9
10	55.9	30.7	50.8	30.2	49.0	30.0
11	55.1	30.4	50.6	30.2	47.7	26.1
12	55.4	30.8	51.0	30.2	48.3	26.3
13	54.4	30.6	50.6	30.3	48.2	27.8
14	54.7	30.7	50.7	30.3	47.6	27.8
15	52.8	30.8	50.4	30.6	48.9	28.9
16	52.5	31.0	50.6	30.6	49.8	29.5
17	52.5	30.8	50.1	30.4	47.6	21.2
18	51.9	31.0	50.0	30.2	46.7	24.8
19	52.2	31.1	49.0	29.3	47.3	27.4
20	51.8	31.2	48.2	28.9	48.5	29.4
21	51.8	31.4	48.9	29.3	47.7	27.6
22	52.1	31.1	49.9	30.2	47.8	27.8
23	52.2	31.4	49.7	28.9	47.2	28.6
24	52.7	31.6	49.4	28.4	48.1	29.3
25	52.7	30.8	48.4	28.9	48.4	29.1
26	52.8	31.5	47.5	29.1	48.2	28.9
27	52.6	31.5	47.4	29.7	47.4	27.7
28	52.4	31.4	47.8	29.8	46.5	27.7
29	52.2	31.4	47.4	29.7	47.8	29.0
30	52.1	31.2	47.6	29.5	46.4	27.6
31	51.8	31.4	0.0	0.0	46.5	28.5
MEANS	53.6	31.1	49.8	29.8	47.9	28.3
OBSVNS.	31	31	30	30	31	31
YRLY.MEANS..					50.0	30.0
MAXIMUM	55.9	31.6	52.1	31.0	49.8	30.3
MINIMUM	51.8	30.4	47.4	28.4	46.4	21.2
STD.DEV.	1.50	.39	1.35	.62	.83	1.86

AMPHITRITE POINT 48 55 16 N 125 32 17 W

DATE	JANUARY TEMP	JANUARY SAL	FEBRUARY TEMP	FEBRUARY SAL	MARCH TEMP	MARCH SAL 1976
1	43.9	25.9	45.4	27.4	* 43.4	* 26.2
2	43.7	26.3	45.9	27.3	43.1	26.5
3	45.6	24.2	45.6	26.9	42.0	26.4
4	46.6	28.1	45.0	27.7	43.8	27.4
5	45.7	26.7	44.6	26.1	44.2	27.4
6	45.4	28.2	44.6	26.4	44.2	27.8
7	45.2	25.2	44.3	27.4	45.0	27.4
8	45.8	28.0	45.5	30.0	44.4	27.6
9	45.9	28.1	45.8	29.5	44.3	23.9
10	45.9	26.5	45.6	28.9	44.0	23.9
11	45.8	28.8	45.6	25.0	44.5	28.2
12	44.9	28.1	45.9	29.9	43.2	26.1
13	44.3	26.8	45.6	28.5	44.0	29.0
14	46.3	28.5	45.5	29.1	44.1	28.5
15	45.9	27.1	45.5	28.0	44.8	28.6
16	46.0	26.8	45.9	28.8	45.4	28.6
17	46.4	27.6	45.6	28.2	45.3	28.5
18	45.8	27.3	45.8	30.7	45.7	23.7
19	45.5	27.3	45.9	29.5	45.5	29.4
20	45.7	27.1	45.2	29.9	45.4	29.7
21	45.3	26.9	45.5	29.1	* 45.4	* 23.8
22	45.6	25.9	45.6	28.8	45.4	29.9
23	45.2	26.8	44.9	28.5	44.8	28.2
24	45.3	26.9	44.5	26.9	45.2	28.9
25	44.8	27.4	* 44.3	* 26.9	45.7	30.7
26	44.5	27.4	44.1	26.8	45.3	29.0
27	* 45.1	* 27.0	43.6	26.0	45.5	30.2
28	45.7	26.5	43.3	28.2	45.3	28.2
29	45.9	26.0	43.6	26.3	44.8	27.7
30	45.9	27.6	0.0	0.0	45.0	23.5
31	45.6	27.8	0.0	0.0	45.7	27.6
MEANS	45.5	27.1	45.1	28.1	44.7	27.7
OBSVNS.	30	30	28	28	29	29
MAXIMUM	46.6	28.8	45.9	30.7	45.7	30.7
MINIMUM	43.7	24.2	43.3	25.0	42.0	23.5
STD.DEV.	.68	1.0[illegible]	.77	1.44	.89	1.93

AMPHITRITE POINT   48 55 16 N   125 32 17 W

DATE	APRIL TEMP	APRIL SAL	MAY TEMP	MAY SAL	JUNE TEMP	JUNE SAL 1976
1	46.4	28.0	51.0	29.5	52.3	29.5
2	47.0	29.1	48.3	30.4	52.2	29.3
3	46.9	29.4	50.5	30.2	51.4	30.3
4	46.8	29.3	49.1	28.5	52.4	29.8
5	47.1	29.4	47.9	31.2	51.6	30.2
6	47.3	30.0	48.7	30.4	51.4	29.8
7	47.5	28.5	48.5	31.0	52.0	30.2
8	47.0	27.3	47.5	31.0	51.8	30.2
9	47.8	28.4	49.4	30.2	52.5	30.2
10	47.3	29.1	50.9	29.8	52.1	29.3
11	47.8	27.6	47.8	31.2	51.3	29.7
12	47.8	28.1	50.6	29.7	51.4	29.9
13	47.5	28.9	49.7	30.7	52.6	30.0
14	47.4	26.7	50.4	29.9	52.6	29.4
15	47.3	29.5	51.9	29.8	51.8	24.6
16	47.5	28.9	50.4	30.0	52.1	29.5
17	47.3	28.1	49.4	31.4	52.3	29.9
18	47.8	29.7	49.8	30.6	51.8	29.4
19	47.9	28.0	50.5	30.7	51.0	29.3
20	47.4	29.1	50.0	30.3	49.4	31.5
21	47.9	29.5	51.6	30.0	49.4	31.6
22	47.2	29.5	51.0	29.8	49.8	31.0
23	47.7	28.9	50.3	29.8	50.1	31.2
24	47.5	28.9	51.3	28.8	49.8	31.6
25	47.7	29.0	49.4	29.9	49.6	31.8
26	48.5	29.0	49.7	27.3	50.5	31.5
27	48.5	28.6	49.6	30.7	51.5	31.6
28	50.3	28.4	49.6	30.6	52.4	30.7
29	51.5	29.0	49.4	28.4	52.3	31.0
30	51.7	28.8	50.0	30.7	52.0	30.7
31	0.0	0.0	50.8	30.0	0.0	0.0
MEANS	47.8	28.8	49.8	30.1	51.4	30.2
OBSVNS.	30	30	31	31	30	30
MAXIMUM	51.7	30.0	51.9	31.4	52.6	31.8
MINIMUM	46.4	26.7	47.5	27.3	49.4	24.6
STD.DEV.	1.23	.74	1.11	.90	1.02	1.33

AMPHITRITE POINT 48 55 16 N 125 32 17 W

	JULY		AUGUST		SEPTEMBER 1976	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	53.5	30.7	54.3	31.1	54.4	29.5
2	55.5	30.0	53.2	31.2	54.9	29.8
3	54.9	28.0	53.3	31.4	53.8	29.7
4	56.3	28.6	54.0	31.1	55.2	24.4
5	59.7	28.0	53.3	31.2	53.7	27.4
6	57.0	26.0	55.2	31.0	53.2	31.0
7	55.7	26.3	52.3	30.2	53.8	29.5
8	* 55.7	* 27.6	51.4	30.8	55.5	29.4
9	55.6	28.9	55.5	30.6	55.9	29.8
10	56.9	28.0	55.7	30.6	55.6	29.3
11	56.3	30.2	56.2	30.6	56.6	29.1
12	55.8	30.2	54.9	31.2	56.1	28.9
13	57.4	29.4	55.3	28.0	56.7	29.1
14	56.5	30.3	55.7	30.2	55.9	29.9
15	56.0	30.7	50.0	29.9	55.5	29.4
16	53.3	31.1	53.5	27.7	55.7	29.5
17	54.0	31.0	55.5	29.5	55.3	29.7
18	55.1	31.2	* 55.6	* 27.9	54.4	29.5
19	54.4	30.6	53.7	26.3	53.8	29.5
20	54.4	30.3	54.3	28.8	53.0	27.3
21	54.5	29.8	53.5	30.3	* 54.2	* 28.6
22	55.3	29.7	53.7	29.8	55.4	29.9
23	55.7	29.7	55.0	29.8	57.0	29.3
24	55.3	30.0	55.9	29.0	57.5	30.6
25	56.5	30.3	55.5	29.1	57.7	29.4
26	52.5	31.2	56.0	29.4	56.9	29.5
27	55.0	30.4	55.0	23.0	55.2	29.8
28	53.2	30.8	55.2	27.7	54.7	30.3
29	54.0	31.1	55.4	28.0	54.4	30.4
30	53.7	31.1	56.2	29.0	54.4	30.0
31	53.9	31.4	54.5	30.0	0.0	0.0
MEANS	55.3	29.8	54.5	29.6	55.2	29.3
OBSVNS.	30	30	30	30	29	29
MAXIMUM	59.7	31.4	56.2	31.4	57.7	31.0
MINIMUM	52.5	26.0	50.0	23.0	53.0	24.4
STD.DEV.	1.50	1.39	1.50	1.78	1.25	1.21

AMPHITRITE POINT 48 55 16 N 125 32 17 W

	OCTOBER		NOVEMBER		DECEMBER 1975	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	54.9	30.3	50.3	29.0	47.6	29.8
2	54.4	30.2	50.1	28.5	48.2	30.3
3	52.2	30.0	50.1	29.0	47.7	29.9
4	53.3	30.3	50.5	28.9	47.5	29.8
5	53.4	29.9	51.4	29.1	47.9	29.9
6	53.2	29.7	51.0	28.8	48.6	30.0
7	53.3	30.0	50.5	29.5	48.3	27.1
8	53.1	29.7	50.9	28.2	* 48.4	* 28.3
9	53.7	27.3	51.3	28.6	48.5	29.5
10	53.6	27.4	51.6	29.7	49.4	29.3
11	53.5	29.1	51.0	29.4	49.7	31.1
12	53.3	29.0	50.8	28.9	49.5	30.7
13	53.6	29.1	50.4	29.0	48.8	29.3
14	53.4	29.0	* 50.6	* 28.4	48.5	28.2
15	53.7	29.1	* 50.8	* 27.8	48.4	26.3
16	53.0	29.5	51.0	27.2	48.5	25.8
17	52.6	29.8	* 51.0	* 27.5	48.3	26.5
18	52.2	29.1	50.9	27.8	47.6	29.5
19	51.2	29.3	50.7	28.9	47.3	28.1
20	51.9	29.5	50.2	29.1	48.0	30.0
21	51.9	29.7	50.6	28.9	47.7	28.2
22	50.8	29.8	50.8	29.7	47.9	28.5
23	50.0	29.7	51.0	29.8	47.5	29.3
24	* 50.3	* 28.9	51.4	28.9	47.2	27.8
25	* 50.6	* 28.1	50.7	29.4	47.6	29.1
26	51.0	27.3	49.9	29.5	48.4	28.5
27	50.9	29.0	49.0	29.5	48.0	29.1
28	51.1	27.4	48.7	29.9	48.0	29.1
29	51.0	28.2	49.2	30.3	* 47.5	* 28.9
30	50.2	27.1	48.1	30.0	47.6	28.6
31	* 50.2	* 28.0	0.0	0.0	46.9	28.2
MEANS	52.5	29.1	50.4	29.1	48.1	29.4
OBSVNS.	28	28	27	27	29	29
YRLY.MEANS....................................					50.1	29.[illegible]
MAXIMUM	54.9	30.3	51.6	30.3	49.7	31.1
MINIMUM	50.0	27.1	48.1	27.2	46.9	25.8
STD.DEV.	1.31	.99	.82	.67	.70	1.28

SHERINGHAM POINT 48 22 40 N 123 55 10 W

	JANUARY			FEBRUARY			MARCH		1976
DATE	TEMP		SAL	TEMP		SAL	TEMP		SAL
1	45.7	*	0.0	45.2	*	0.0	44.8	*	0.0
2	45.6	*	0.0	45.2	*	0.0	44.2	*	0.0
3	45.3	*	0.0	45.2	*	0.0	44.6	*	0.0
4	45.7	*	0.0	45.3	*	0.0	44.6	*	0.0
5	45.4	*	0.0	45.3	*	0.0	44.6	*	0.0
6	45.6	*	0.0	44.7	*	0.0	45.1	*	0.0
7	45.3	*	0.0	44.9	*	0.0	44.4	*	0.0
8	45.3	*	0.0	* 44.8	*	0.0	44.3	*	0.0
9	45.4	*	0.0	44.6	*	0.0	44.9	*	0.0
10	45.4	*	0.0	45.0	*	0.0	44.9	*	0.0
11	42.8	*	0.0	44.7	*	0.0	44.5	*	0.0
12	45.3	*	0.0	44.9	*	0.0	44.4	*	0.0
13	44.9	*	0.0	44.7	*	0.0	44.5	*	0.0
14	43.8	*	0.0	44.7	*	0.0	45.0	*	0.0
15	45.3	*	0.0	44.8	*	0.0	44.8	*	0.0
16	44.6	*	0.0	44.6	*	0.0	44.7	*	0.0
17	45.5	*	0.0	44.8	*	0.0	44.7	*	0.0
18	45.0	*	0.0	44.6	*	0.0	45.0	*	0.0
19	45.4	*	0.0	44.7	*	0.0	* 44.7	*	0.0
20	45.1	*	0.0	44.8	*	0.0	44.4	*	0.0
21	44.8	*	0.0	44.7	*	0.0	44.3	*	0.0
22	45.0	*	0.0	44.7	*	0.0	44.1	*	0.0
23	45.1	*	0.0	44.6	*	0.0	44.4	*	0.0
24	44.8	*	0.0	44.5	*	0.0	44.7	*	0.0
25	44.9	*	0.0	44.6	*	0.0	44.6	*	0.0
26	44.9	*	0.0	44.5	*	0.0	44.6	*	0.0
27	45.1	*	0.0	44.7	*	0.0	44.8	*	0.0
28	45.1	*	0.0	44.3	*	0.0	45.0	*	0.0
29	45.1	*	0.0	44.7	*	0.0	45.0	*	0.0
30	45.0	*	0.0	0.0		0.0	44.9	*	0.0
31	44.9	*	0.0	0.0		0.0	45.0	*	0.0
MEANS	45.1		0.0	44.8		0.0	44.7		0.0
OBSVNS.	31		0	28		0	30		0
MAXIMUM	45.7		0.0	45.3		0.0	45.1		0.0
MINIMUM	42.8		0.0	44.3		0.0	44.1		0.0
STD.DEV.	.56		0.00	.25		0.00	.27		0.00

SHERINGHAM POINT 48 22 40 N 123 55 10 W

DATE		APRIL TEMP		APRIL SAL	MAY TEMP		MAY SAL	JUNE TEMP		JUNE SAL 1976
1		45.1	*	0.0	47.8	*	0.0	49.2	*	0.0
2		45.1	*	0.0	47.2	*	0.0	48.8	*	0.0
3		45.2	*	0.0	48.5	*	0.0	49.5	*	0.0
4		45.5	*	0.0	47.3	*	0.0	49.0	*	0.0
5		45.4	*	0.0	47.8	*	0.0	49.5	*	0.0
6	*	45.4	*	0.0	47.9	*	0.0	49.5	*	0.0
7		45.5	*	0.0	48.3	*	0.0	49.3	*	0.0
8		45.6	*	0.0	48.1	*	0.0	49.8	*	0.0
9		45.6	*	0.0	47.6	*	0.0	49.7	*	0.0
10	*	45.9	*	0.0	47.9	*	0.0	50.4	*	0.0
11		46.2	*	0.0	48.5	*	0.0	49.6	*	0.0
12		46.4	*	0.0	48.1	*	0.0	48.0	*	0.0
13		46.6	*	0.0	48.5	*	0.0	49.8	*	0.0
14		46.3	*	0.0	48.9	*	0.0	49.5	*	0.0
15		46.5	*	0.0	49.5	*	0.0	49.8	*	0.0
16		46.7	*	0.0	48.2	*	0.0	49.0	*	0.0
17		46.8	*	0.0	47.9	*	0.0	48.8	*	0.0
18		46.4	*	0.0	48.1	*	0.0	49.2	*	0.0
19		46.8	*	0.0	49.0	*	0.0	50.0	*	0.0
20		47.1	*	0.0	48.6	*	0.0	48.2	*	0.0
21		46.8	*	0.0	47.5	*	0.0	50.2	*	0.0
22		46.4	*	0.0	48.5	*	0.0	51.6	*	0.0
23		46.9	*	0.0	49.6	*	0.0	50.2	*	0.0
24		46.2	*	0.0	48.9	*	0.0	51.6	*	0.0
25		46.7	*	0.0	49.0	*	0.0	50.1	*	0.0
26		47.3	*	0.0	49.1	*	0.0	51.0	*	0.0
27		46.6	*	0.0	48.8	*	0.0	50.4	*	0.0
28		47.2	*	0.0	49.1	*	0.0	51.2	*	0.0
29		46.9	*	0.0	48.0	*	0.0	50.5	*	0.0
30		47.0	*	0.0	49.2	*	0.0	49.8	*	0.0
31		0.0		0.0	48.6	*	0.0	0.0		0.0
MEANS		46.3		0.0	48.4		0.0	49.8		0.0
OBSVNS.		28		0	31		0	30		0
MAXIMUM		47.3		0.0	49.6		0.0	51.6		0.0
MINIMUM		45.1		0.0	47.2		0.0	48.0		0.0
STD.DEV.		.67		0.00	.63		0.00	.87		0.00

SHERINGHAM POINT 48 22 40 N 123 55 10 W

DATE	JULY TEMP		JULY SAL	AUGUST TEMP		AUGUST SAL	SEPTEMBER 1976 TEMP		SEPTEMBER 1976 SAL
1	50.4	*	0.0	50.8	*	0.0	50.2	*	0.0
2	51.6	*	0.0	51.8	*	0.0	50.5	*	0.0
3	50.4	*	0.0	50.8	*	0.0	50.1	*	0.0
4	50.5	*	0.0	51.9	*	0.0	50.8	*	0.0
5	50.1	*	0.0	50.5	*	0.0	50.1	*	0.0
6	51.0	*	0.0	51.4	*	0.0	51.0	*	0.0
7	50.3	*	0.0	51.0	*	0.0	50.6	*	0.0
8	50.5	*	0.0	51.2	*	0.0	51.2	*	0.0
9	50.1	*	0.0	50.7	*	0.0	50.4	*	0.0
10	51.0	*	0.0	50.9	*	0.0	51.2	*	0.0
11	50.2	*	0.0	50.5	*	0.0	50.7	*	0.0
12	50.6	*	0.0	50.8	*	0.0	50.6	*	0.0
13	50.2	*	0.0	49.4	*	0.0	50.6	*	0.0
14	50.1	*	0.0	50.4	*	0.0	50.8	*	0.0
15	50.1	*	0.0	50.5	*	0.0	50.7	*	0.0
16	51.3	*	0.0	50.6	*	0.0	51.2	*	0.0
17	52.0	*	0.0	51.7	*	0.0	50.6	*	0.0
18	51.0	*	0.0	50.4	*	0.0	51.0	*	0.0
19	52.0	*	0.0	51.0	*	0.0	* 51.0	*	0.0
20	52.5	*	0.0	50.2	*	0.0	51.1	*	0.0
21	53.0	*	0.0	52.2	*	0.0	50.6	*	0.0
22	52.6	*	0.0	50.6	*	0.0	50.8	*	0.0
23	53.8	*	0.0	51.2	*	0.0	50.8	*	0.0
24	53.1	*	0.0	50.6	*	0.0	51.6	*	0.0
25	53.0	*	0.0	51.6	*	0.0	50.6	*	0.0
26	52.0	*	0.0	50.5	*	0.0	50.6	*	0.0
27	52.0	*	0.0	50.0	*	0.0	50.4	*	0.0
28	51.0	*	0.0	51.0	*	0.0	49.8	*	0.0
29	52.1	*	0.0	50.8	*	0.0	50.2	*	0.0
30	50.8	*	0.0	50.4	*	0.0	49.8	*	0.0
31	52.1	*	0.0	50.7	*	0.0	0.0		0.0
MEANS	51.3		0.0	50.8		0.0	50.6		0.0
OBSVNS.	31		0	31		0	29		0
MAXIMUM	53.8		0.0	52.2		0.0	51.6		0.0
MINIMUM	50.1		0.0	49.4		0.0	49.8		0.0
STD.DEV.	1.09		0.00	.59		0.00	.42		0.00

SHERINGHAM POINT 48 22 40 N 123 55 10 W

	OCTOBER		NOVEMBER		DECEMBER	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	50.3	* 0.0	48.0	* 0.0	47.1	* 0.0
2	50.2	* 0.0	49.1	* 0.0	46.2	* 0.0
3	50.0	* 0.0	49.0	* 0.0	46.4	* 0.0
4	50.0	* 0.0	48.9	* 0.0	46.5	* 0.0
5	50.2	* 0.0	48.1	* 0.0	46.2	* 0.0
6	50.8	* 0.0	48.3	* 0.0	46.5	* 0.0
7	50.1	* 0.0	47.8	* 0.0	46.1	* 0.0
8	50.5	* 0.0	48.6	* 0.0	* 46.1	* 0.0
9	50.4	* 0.0	48.0	* 0.0	46.0	* 0.0
10	50.6	* 0.0	* 49.0	* 0.0	47.5	* 0.0
11	* 50.3	* 0.0	48.0	* 0.0	46.4	* 0.0
12	50.0	* 0.0	48.2	* 0.0	47.0	* 0.0
13	49.6	* 0.0	47.8	* 0.0	46.2	* 0.0
14	50.0	* 0.0	48.0	* 0.0	46.9	* 0.0
15	49.7	* 0.0	47.8	* 0.0	46.1	* 0.0
16	49.8	* 0.0	48.1	* 0.0	46.6	* 0.0
17	49.7	* 0.0	48.2	* 0.0	47.0	* 0.0
18	49.6	* 0.0	47.7	* 0.0	46.3	* 0.0
19	49.5	* 0.0	48.2	* 0.0	46.8	* 0.0
20	49.8	* 0.0	47.9	* 0.0	46.9	* 0.0
21	49.5	* 0.0	48.0	* 0.0	46.3	* 0.0
22	49.0	* 0.0	47.8	* 0.0	46.5	* 0.0
23	49.8	* 0.0	47.0	* 0.0	46.6	* 0.0
24	49.2	* 0.0	47.6	* 0.0	46.8	* 0.0
25	49.6	* 0.0	47.2	* 0.0	* 46.5	* 0.0
26	47.8	* 0.0	47.6	* 0.0	46.8	* 0.0
27	49.4	* 0.0	47.5	* 0.0	46.2	* 0.0
28	47.6	* 0.0	47.2	* 0.0	46.0	* 0.0
29	49.4	* 0.0	47.5	* 0.0	45.9	* 0.0
30	49.5	* 0.0	46.8	* 0.0	46.5	* 0.0
31	49.4	* 0.0	0.0	0.0	46.2	* 0.0
MEANS	49.7	0.0	47.9	0.0	46.5	0.0
OBSVNS.	30	0	29	0	29	0
YRLY.MEANS................................					48.0	0.0
MAXIMUM	50.8	0.0	49.1	0.0	47.5	0.0
MINIMUM	47.6	0.0	46.8	0.0	45.9	0.0
STD.DEV.	.59	0.00	.50	0.00	.39	0.00

RACE ROCKS 48 17 57 N 123 31 48 W

	JANUARY		FEBRUARY		MARCH	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.4	31.0	45.0	31.1	44.6	31.8
2	45.0	31.0	45.0	30.8	44.4	30.7
3	45.1	31.0	45.0	31.4	44.2	31.2
4	45.0	31.0	45.2	31.1	44.4	30.6
5	45.3	30.8	45.0	31.0	44.5	30.8
6	45.3	31.0	44.8	30.7	44.6	30.8
7	45.2	30.8	44.7	30.7	44.4	30.8
8	45.1	30.8	44.4	30.7	44.0	30.8
9	45.2	31.0	44.5	30.8	44.2	31.1
10	45.3	31.1	44.7	30.7	44.4	30.8
11	45.2	31.0	44.8	* 30.9	44.6	30.8
12	44.8	30.7	44.8	31.1	44.2	30.7
13	44.8	30.6	44.8	30.7	44.8	31.0
14	45.0	30.6	44.6	31.1	44.8	30.8
15	45.2	30.6	44.8	30.8	44.8	31.2
16	45.3	30.7	44.8	31.2	44.6	30.9
17	45.5	31.0	44.9	31.8	44.8	31.0
18	45.2	30.9	44.9	31.8	44.6	30.8
19	45.2	31.0	45.0	31.4	44.5	31.6
20	45.1	31.0	45.0	31.4	44.8	31.5
21	45.0	31.1	44.9	31.5	44.8	31.8
22	45.1	31.0	44.6	31.4	44.8	31.8
23	44.6	31.4	44.6	31.2	44.5	31.4
24	44.5	30.7	44.5	31.0	44.5	31.8
25	44.6	30.4	44.3	30.8	44.6	31.2
26	44.6	30.4	44.3	30.8	44.9	31.2
27	45.2	30.4	44.4	30.7	44.8	31.0
28	45.4	30.8	44.2	31.2	44.9	30.7
29	45.6	31.0	44.6	31.2	45.2	31.0
30	45.3	30.7	0.0	0.0	45.1	30.8
31	45.2	30.8	0.0	0.0	45.1	31.1
MEANS	45.1	30.9	44.7	31.1	44.6	31.1
OBSVNS.	31	31	29	28	31	31
MAXIMUM	45.6	31.4	45.2	31.8	45.2	31.8
MINIMUM	44.5	30.4	44.2	30.7	44.0	30.6
STD.DEV.	.26	.23	.25	.33	.28	.37

RACE ROCKS 48 17 57 N 123 31 48 W

	APRIL		MAY		JUNE	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.0	31.0	47.4	31.5	48.0	32.0
2	45.9	31.0	47.5	31.6	47.5	32.0
3	45.5	31.2	47.4	31.5	48.5	32.3
4	46.0	31.4	47.6	31.6	48.5	32.0
5	45.8	31.2	46.5	31.4	48.4	32.0
6	45.9	31.4	47.5	31.6	48.3	31.8
7	45.4	31.0	47.8	31.4	49.0	31.6
8	46.1	31.1	47.5	31.5	49.0	31.5
9	45.5	30.8	47.9	31.8	48.5	31.4
10	46.0	31.1	47.8	31.6	48.7	31.2
11	46.0	32.1	48.1	31.9	48.2	31.9
12	46.2	31.1	47.5	31.5	48.0	32.0
13	46.1	31.2	47.0	31.5	48.5	32.3
14	45.8	30.8	46.5	31.6	48.0	32.8
15	45.9	31.1	47.2	31.5	48.0	32.4
16	46.0	31.9	47.4	31.8	48.2	32.3
17	46.1	32.0	47.2	31.5	47.7	31.4
18	46.2	31.8	47.8	31.5	47.8	31.9
19	46.4	31.6	47.4	31.5	48.2	31.9
20	45.5	31.1	47.5	31.5	48.2	31.8
21	45.8	31.2	48.1	31.8	49.1	31.6
22	45.9	31.1	48.0	31.2	49.8	31.5
23	45.7	31.5	49.0	31.5	50.0	31.1
24	46.5	31.4	48.6	31.1	50.1	31.1
25	46.4	31.2	49.0	31.2	50.7	30.8
26	47.1	31.4	48.7	31.1	49.9	31.4
27	47.2	31.5	48.8	31.2	51.1	30.7
28	47.3	31.8	48.2	31.9	51.1	31.1
29	47.3	31.5	48.4	31.9	50.2	30.6
30	47.5	31.6	48.1	32.0	49.7	31.2
31	0.0	0.0	47.8	32.1	0.0	0.0
MEANS	46.1	31.3	47.7	31.6	48.9	31.7
OBSVNS.	30	30	31	31	30	30
MAXIMUM	47.5	32.1	49.0	32.1	51.1	32.8
MINIMUM	45.0	30.8	46.5	31.1	47.5	30.6
STD.DEV.	.61	.34	.59	.25	1.04	.53

RACE ROCKS 48 17 57 N 123 31 48 W

	JULY		AUGUST		SEPTEMBER 1976	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	50.2	31.4	50.8	30.8	50.1	31.6
2	50.1	31.4	50.6	31.1	49.9	31.6
3	50.2	31.1	50.5	30.8	50.2	31.4
4	49.3	31.2	50.2	31.0	50.6	31.2
5	49.8	31.4	50.0	31.1	50.2	31.2
6	49.8	31.4	50.2	31.4	50.2	31.1
7	49.9	31.5	49.8	31.6	50.4	31.1
8	49.6	31.6	50.0	31.8	50.5	30.8
9	50.2	31.6	50.2	31.9	50.5	31.0
10	50.1	31.8	49.7	32.0	50.3	30.8
11	49.0	32.0	49.6	31.9	50.4	30.8
12	48.6	32.4	50.6	31.9	50.2	30.6
13	49.0	32.1	49.6	31.6	50.5	30.4
14	49.7	32.0	50.1	31.5	50.3	30.6
15	49.9	32.5	50.7	31.5	50.0	30.2
16	50.0	32.0	50.3	31.4	50.3	30.4
17	50.3	31.4	50.8	31.1	50.4	30.2
18	49.9	31.5	50.8	30.8	50.4	30.0
19	51.0	31.8	51.0	30.8	50.8	30.2
20	51.2	31.9	51.1	30.6	51.0	29.5
21	51.0	31.5	51.2	31.0	51.0	29.7
22	51.3	31.1	51.2	31.0	51.2	29.4
23	* 51.6	* 30.6	50.1	31.0	50.7	29.8
24	52.0	30.0	50.1	31.4	50.0	30.4
25	51.3	30.6	50.2	31.6	49.7	31.1
26	50.2	31.2	50.0	31.6	49.2	31.4
27	50.2	31.2	49.9	31.4	49.5	31.1
28	50.4	31.5	50.0	31.4	48.7	31.5
29	50.2	31.4	49.9	31.5	48.9	31.2
30	50.5	32.1	50.0	31.5	48.8	31.2
31	51.5	31.6	50.0	31.4	0.0	0.0
MEANS	50.2	31.5	50.3	31.3	50.2	30.7
OBSVNS.	30	30	31	31	30	30
MAXIMUM	52.0	32.5	51.2	32.0	51.2	31.6
MINIMUM	48.6	30.0	49.6	30.6	48.7	29.4
STD.DEV.	.77	.50	.47	.38	.62	.63

RACE ROCKS 48 17 57 N 123 31 48 W

DATE	OCTOBER TEMP	OCTOBER SAL	NOVEMBER TEMP	NOVEMBER SAL	DECEMBER 1976 TEMP	DECEMBER 1976 SAL
1	49.1	31.0	48.0	31.2	46.6	30.7
2	49.4	31.0	48.2	31.2	46.8	31.0
3	49.6	30.8	48.1	31.1	46.7	30.8
4	49.7	30.7	48.2	31.2	46.6	30.7
5	49.7	30.6	48.0	31.0	46.7	30.8
6	49.8	30.4	48.0	31.0	46.8	31.0
7	50.0	30.6	48.2	31.2	47.0	31.2
8	50.2	30.3	45.2	31.0	47.0	31.2
9	50.0	30.4	48.1	30.8	46.8	31.5
10	49.9	30.4	47.9	30.8	46.8	31.4
11	49.8	30.7	48.0	31.0	46.6	31.5
12	50.1	30.4	47.8	31.0	46.6	31.5
13	49.0	30.7	47.7	31.1	46.7	31.2
14	49.1	30.8	47.5	31.2	46.6	31.1
15	48.7	30.6	47.8	31.0	46.7	31.2
16	49.1	30.6	47.9	30.7	46.7	31.0
17	49.0	30.4	47.8	30.8	46.8	31.0
18	49.4	30.3	47.6	30.7	46.6	31.2
19	49.6	29.7	47.6	31.0	46.7	31.4
20	49.4	29.8	47.7	30.8	46.5	31.5
21	49.1	29.9	47.5	31.0	46.7	31.4
22	48.5	30.0	47.6	31.2	46.6	31.5
23	48.0	30.8	47.4	31.2	46.7	31.2
24	48.0	31.0	47.4	31.4	46.6	31.5
25	47.8	31.4	47.2	31.4	46.6	31.4
26	47.7	31.5	46.7	31.9	46.5	31.6
27	48.0	31.2	46.7	31.6	46.5	31.5
28	47.5	31.8	45.8	31.5	46.4	31.6
29	47.7	31.5	46.6	31.4	46.3	31.5
30	47.7	31.6	46.7	31.4	46.3	31.4
31	47.9	31.4	0.0	0.0	46.2	31.6
MEANS	49.0	30.7	47.6	31.1	46.6	31.3
OBSVNS.	31	31	30	30	31	31
YRLY.MEANS..					47.6	31.2
MAXIMUM	50.2	31.8	48.2	31.9	47.0	31.6
MINIMUM	47.5	29.7	46.6	30.7	46.2	30.7
STD.DEV.	.86	.53	.50	.28	.18	.28

CAPE MUDGE 49 59 56 N 125 11 38 W

	JANUARY		FEBRUARY		MARCH		1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL	
1	45.7	28.5	45.8	28.5	44.6	28.9	
2	* 0.0	* 0.0	45.9	28.8	44.7	28.8	
3	* 0.0	* 0.0	44.5	28.5	39.5	28.4	
4	* 0.0	* 0.0	41.6	28.1	42.2	28.6	
5	44.2	27.8	41.2	28.4	44.2	28.9	
6	44.0	28.0	43.3	28.5	44.6	28.9	
7	* 43.9	* 28.0	44.8	28.5	45.0	28.8	
8	43.8	28.0	* 44.5	* 28.4	44.8	28.4	
9	45.2	28.0	44.1	28.2	45.3	28.6	
10	44.3	27.8	44.6	28.1	45.2	28.5	
11	44.2	27.4	* 45.4	* 28.1	45.4	28.1	
12	44.1	27.4	46.2	28.1	* 45.8	* 28.6	
13	42.3	26.5	* 46.2	* 28.3	46.3	29.1	
14	44.3	27.4	46.1	28.6	47.2	29.1	
15	45.8	28.5	* 45.2	* 28.7	46.7	29.0	
16	46.0	28.4	46.4	28.9	45.8	29.1	
17	46.4	28.5	* 45.4	* 28.7	* 45.3	* 29.1	
18	46.2	28.8	44.4	28.4	44.7	29.0	
19	45.7	28.6	44.9	28.5	44.7	28.9	
20	43.8	28.0	42.4	28.5	* 44.7	* 28.9	
21	44.7	28.2	* 43.3	* 28.5	* 44.8	* 28.8	
22	44.3	28.1	* 44.2	* 28.4	44.9	28.8	
23	44.9	28.5	45.1	28.4	* 44.9	* 28.5	
24	44.6	28.4	* 44.3	* 28.2	45.0	28.1	
25	44.7	28.4	43.4	28.0	46.4	28.4	
26	* 45.7	* 28.6	45.9	28.6	* 47.1	* 28.6	
27	46.8	28.9	43.4	28.5	47.6	28.8	
28	* 46.7	* 28.9	44.2	28.5	47.9	28.5	
29	46.6	28.8	45.0	28.4	* 47.0	* 28.7	
30	46.1	28.8	0.0	0.0	46.1	29.0	
31	46.3	28.8	0.0	0.0	47.1	28.5	
MEANS	45.0	28.2	44.4	28.4	45.3	28.7	
OBSVNS.	25	25	21	21	24	24	
MAXIMUM	46.8	28.9	46.4	28.9	47.9	29.1	
MINIMUM	42.3	26.5	41.2	28.0	39.5	28.1	
STD.DEV.	1.11	.57	1.47	.23	1.77	.30	

CAPE MUDGE 49 59 56 N 125 11 38 W

	APRIL		MAY		JUNE		1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL	
1	47.5	28.6	47.5	29.1	52.6	27.3	
2	46.9	29.3	47.8	29.0	49.6	27.7	
3	44.2	28.8	47.4	28.9	49.4	27.8	
4	45.8	28.9	47.6	29.0	51.2	26.8	
5	46.3	29.0	47.5	29.1	52.3	27.1	
6	45.7	28.1	48.3	28.9	54.4	27.1	
7	45.1	28.6	49.3	29.3	57.7	27.4	
8	46.4	28.5	50.2	28.9	58.7	27.8	
9	47.8	29.0	53.1	28.9	* 0.0	* 0.0	
10	47.8	29.1	50.8	29.0	* 0.0	* 0.0	
11	47.4	28.0	* 50.9	* 29.1	* 0.0	* 0.0	
12	51.0	28.9	51.0	29.3	54.4	27.4	
13	52.7	28.9	53.3	29.0	56.7	27.2	
14	* 50.9	* 28.9	51.8	29.1	51.7	27.8	
15	49.0	29.0	47.1	29.1	51.5	27.6	
16	* 47.4	* 28.9	47.7	29.0	52.6	26.7	
17	45.7	28.8	47.1	29.1	54.6	26.0	
18	46.5	29.0	47.7	29.0	57.0	25.2	
19	46.1	29.1	48.5	29.1	57.4	25.9	
20	46.3	29.0	49.0	28.9	59.2	25.8	
21	47.7	29.0	49.9	29.0	56.5	25.8	
22	47.7	29.1	53.2	28.9	56.5	27.1	
23	* 47.8	* 29.1	* 0.0	* 0.0	57.3	27.3	
24	47.9	29.1	* 0.0	* 0.0	53.7	26.8	
25	51.7	28.9	* 0.0	* 0.0	55.7	27.3	
26	49.9	29.1	* 0.0	* 0.0	56.1	28.0	
27	49.1	28.6	51.3	29.1	55.1	28.4	
28	49.4	29.0	* 0.0	* 0.0	52.5	28.5	
29	49.4	28.9	* 0.0	* 0.0	* 53.1	* 27.9	
30	50.9	28.8	* 0.0	* 0.0	53.8	27.3	
31	0.0	0.0	53.7	26.9	0.0	0.0	
MEANS	47.8	28.9	49.6	28.9	54.6	27.1	
OBSVNS.	27	27	23	23	26	26	
MAXIMUM	52.7	29.3	53.7	29.3	59.2	28.5	
MINIMUM	44.2	28.0	47.1	26.9	49.4	25.2	
STD.DEV.	2.12	.30	2.25	.46	2.73	.82	

CAPE MUDGE 49 59 56 N 125 11 38 W

DATE	JULY TEMP	JULY SAL	AUGUST TEMP	AUGUST SAL	SEPTEMBER 1976 TEMP	SEPTEMBER 1976 SAL
1	53.2	27.4	55.0	26.9	58.6	24.4
2	52.5	27.6	58.1	26.1	56.9	24.6
3	52.4	27.4	59.5	26.1	* 57.5	* 24.5
4	57.3	27.1	* 60.8	* 25.9	* 58.1	* 24.4
5	60.5	26.0	62.2	25.6	58.8	24.2
6	58.6	25.0	57.9	27.2	58.0	25.0
7	* 0.0	* 0.0	59.7	26.1	58.5	25.0
8	* 0.0	* 0.0	55.8	26.9	61.4	23.9
9	* 0.0	* 0.0	56.2	26.7	60.4	24.7
10	60.4	24.3	65.3	25.0	55.9	25.1
11	59.3	24.7	61.9	24.8	56.4	24.7
12	* 59.6	* 24.7	* 60.5	* 24.9	55.7	25.4
13	60.0	24.8	* 59.0	* 25.0	* 55.4	* 25.3
14	60.8	24.8	57.5	25.1	55.1	25.1
15	57.0	24.4	59.4	23.9	55.9	25.6
16	55.7	25.8	* 58.2	* 24.5	57.2	25.2
17	53.8	26.7	55.9	25.1	53.0	26.4
18	53.7	26.5	* 57.1	* 24.9	57.3	25.4
19	53.9	26.3	* 57.3	* 24.7	52.8	27.2
20	56.5	26.9	57.5	24.4	59.4	25.0
21	* 56.1	* 26.7	54.6	25.9	53.8	26.0
22	55.6	26.5	60.3	24.0	52.9	26.0
23	60.4	24.0	58.4	24.0	53.9	26.7
24	60.1	25.4	55.8	25.6	55.5	26.1
25	59.2	26.0	57.7	25.6	54.2	26.1
26	60.1	25.4	* 56.0	* 25.5	53.8	26.1
27	56.4	27.2	54.3	25.4	52.1	26.9
28	54.2	27.8	57.1	24.8	52.5	27.2
29	54.4	27.3	58.7	24.6	55.4	25.8
30	52.7	27.4	55.8	24.4	54.1	26.3
31	51.1	27.7	* 57.8	* 24.4	0.0	0.0
MEANS	56.5	26.2	58.1	25.4	55.9	25.6
OBSVNS.	26	26	23	23	27	27
MAXIMUM	60.8	27.8	65.3	27.2	61.4	27.2
MINIMUM	51.1	24.0	54.3	23.9	52.1	23.9
STD.DEV.	3.12	1.20	2.61	.98	2.55	.90

CAPE MUDGE 49 59 56 N 125 11 38 W

DATE	OCTOBER TEMP	OCTOBER SAL	NOVEMBER TEMP	NOVEMBER SAL	DECEMBER 1976 TEMP	DECEMBER 1976 SAL
1	53.8	26.7	49.2	28.4	46.4	28.9
2	52.8	27.1	48.8	28.4	47.2	29.3
3	53.8	28.1	51.4	28.5	46.9	29.3
4	50.4	28.6	49.0	28.9	46.8	28.9
5	49.6	28.9	49.3	28.9	46.4	29.1
6	52.7	28.6	48.4	28.9	47.0	29.3
7	52.7	28.0	48.3	28.9	47.0	29.1
8	* 51.5	* 28.4	48.4	28.9	* 45.4	* 28.5
9	50.4	28.8	48.5	28.2	43.8	27.8
10	51.3	27.2	48.1	28.2	45.2	28.1
11	51.2	27.3	47.3	28.1	46.6	28.8
12	51.8	27.1	47.3	28.4	46.7	28.9
13	51.3	26.7	47.3	27.6	46.3	29.1
14	50.9	27.2	47.3	27.7	46.8	28.9
15	51.0	27.4	47.4	28.8	* 46.9	* 28.9
16	51.7	27.7	47.8	28.8	* 47.1	* 28.9
17	51.0	28.0	48.7	28.9	47.3	28.9
18	51.5	27.3	47.5	28.6	47.1	29.0
19	51.7	28.0	48.5	29.3	46.2	28.9
20	51.3	27.3	47.6	28.8	* 46.4	* 28.9
21	50.3	28.8	48.2	28.9	* 46.6	* 29.0
22	46.7	28.5	47.7	29.1	46.6	29.0
23	* 48.8	* 28.7	47.9	29.5	44.2	27.4
24	* 49.0	* 28.9	47.3	28.4	45.0	28.1
25	49.2	29.1	45.3	28.9	* 45.7	* 28.5
26	* 49.1	* 29.0	45.5	28.6	46.5	28.9
27	* 48.9	* 28.8	46.3	28.9	45.9	28.5
28	48.7	28.6	47.0	28.6	46.2	28.4
29	48.6	28.4	46.3	28.4	46.1	28.6
30	* 48.8	* 28.4	46.4	28.4	44.8	28.0
31	* 49.0	* 28.4	0.0	0.0	45.1	28.1

MEANS	51.1	27.9	47.8	28.6	46.2	28.7
OBSVNS.	24	24	30	30	25	25
YRLY.MEANS..................................					50.3	27.7
MAXIMUM	53.8	29.1	51.4	29.5	47.3	29.3
MINIMUM	48.5	26.7	45.3	27.6	43.8	27.4
STD.DEV.	1.47	.74	1.22	.42	.95	.51

SISTERS ISLAND 49 29 13 N 124 26 00 W

JANUARY FEBRUARY MARCH 1976

DATE	JANUARY TEMP	JANUARY SAL	FEBRUARY TEMP	FEBRUARY SAL	MARCH TEMP	MARCH SAL
1	44.8	27.4	43.5	27.2	43.4	28.9
2	44.0	27.3	43.2	27.1	42.5	28.9
3	44.0	27.3	43.8	27.4	42.2	28.4
4	44.5	27.7	43.5	27.6	42.0	28.4
5	44.2	27.4	43.0	27.6	42.4	28.4
6	44.2	27.6	43.4	27.6	42.2	28.0
7	44.2	27.6	43.5	27.6	42.2	28.0
8	44.2	27.4	43.8	27.6	42.8	28.1
9	43.8	27.2	44.0	28.2	43.2	28.1
10	44.4	27.6	44.4	28.2	43.5	28.1
11	44.0	27.6	44.0	28.4	44.0	28.5
12	43.8	27.6	44.4	27.8	44.0	28.4
13	43.8	27.3	45.0	28.2	44.0	28.2
14	44.1	27.8	44.8	28.5	44.6	28.2
15	44.3	28.1	44.5	28.4	44.4	28.0
16	44.5	28.0	45.0	28.5	45.0	28.2
17	44.1	27.8	44.3	28.5	44.5	28.2
18	43.9	27.7	44.3	28.8	44.2	28.2
19	43.5	27.8	44.6	28.8	43.5	28.4
20	43.3	28.1	43.7	28.8	44.3	28.9
21	43.1	28.1	44.4	28.8	44.2	29.0
22	43.3	28.0	44.9	28.9	44.4	29.0
23	43.2	28.1	44.8	28.9	44.5	28.9
24	43.3	28.2	44.9	29.3	44.7	28.8
25	43.2	28.4	44.5	28.9	45.3	28.9
26	43.4	28.2	44.1	28.9	45.0	28.6
27	44.3	28.5	42.6	28.8	45.4	29.0
28	44.5	28.8	42.8	28.5	45.2	28.9
29	44.3	28.4	43.5	28.9	45.2	28.9
30	44.4	28.5	0.0	0.0	45.2	28.8
31	44.5	28.2	0.0	0.0	45.3	28.9
MEANS	44.0	27.9	44.0	28.3	44.0	28.5
OBSVNS.	31	31	29	29	31	31
MAXIMUM	44.8	28.8	45.0	29.3	45.4	29.0
MINIMUM	43.1	27.2	42.6	27.1	42.0	28.0
STD.DEV.	.47	.42	.70	.61	1.08	.76

SISTERS ISLAND   49 29 13 N   124 26 00 W

DATE	APRIL TEMP	APRIL SAL	MAY TEMP	MAY SAL	JUNE TEMP	JUNE SAL
						1976
1	46.5	28.8	52.1	29.0	52.3	20.5
2	46.2	29.0	52.1	29.0	53.2	22.2
3	45.5	29.1	52.0	29.3	51.5	23.8
4	45.6	29.0	51.6	29.4	53.5	24.7
5	45.5	29.1	51.9	29.3	53.2	24.9
6	46.0	29.1	51.5	29.1	57.0	25.4
7	46.5	29.0	54.0	29.0	60.0	25.9
8	47.2	28.8	54.6	29.1	59.0	25.9
9	47.0	28.9	54.3	29.0	56.4	25.5
10	48.5	29.0	54.7	29.1	57.0	25.6
11	47.5	28.8	50.5	29.1	54.0	26.0
12	49.4	28.9	51.5	28.9	55.8	25.8
13	49.5	28.9	52.0	29.0	56.5	21.0
14	46.5	29.0	55.0	24.2	55.4	21.7
15	46.5	28.9	55.6	25.6	54.6	22.6
16	46.0	28.9	53.5	28.8	54.0	24.3
17	46.2	28.9	50.6	28.9	59.4	19.0
18	46.0	28.8	51.0	28.9	60.6	19.0
19	46.2	28.8	53.5	28.6	57.2	21.4
20	45.7	28.9	50.7	28.9	57.4	23.7
21	46.4	29.1	54.4	23.5	59.0	24.2
22	46.9	29.1	55.0	26.3	59.6	24.4
23	47.0	29.4	56.6	23.5	59.7	25.2
24	47.6	28.9	54.0	25.8	55.9	26.3
25	48.5	29.1	52.6	26.7	57.6	26.0
26	48.2	29.3	51.1	28.2	56.2	25.8
27	48.9	29.1	52.3	26.8	57.4	26.0
28	48.2	28.5	52.1	21.6	58.3	26.1
29	52.3	28.9	51.1	25.9	57.6	26.9
30	53.2	28.9	50.7	27.3	58.3	25.1
31	0.0	0.0	50.7	23.3	0.0	0.0
MEANS	47.4	29.0	52.7	27.5	56.6	24.2
OBSVNS.	30	30	31	31	30	30
MAXIMUM	53.2	29.4	56.6	29.4	60.6	26.9
MINIMUM	45.5	28.5	50.5	21.6	51.5	19.0
STD.DEV.	1.86	.17	1.71	2.23	2.44	2.22

SISTERS ISLAND 49 29 13 N 124 26 30 W

DATE	JULY TEMP	JULY SAL	AUGUST TEMP	AUGUST SAL	SEPTEMBER 1976 TEMP	SEPTEMBER 1976 SAL
1	58.9	24.2	62.0	24.6	61.8	20.5
2	59.8	23.1	62.9	21.6	61.9	23.0
3	59.7	22.4	64.5	22.4	61.3	22.9
4	59.8	23.4	64.3	22.6	58.5	24.6
5	59.6	23.0	63.6	24.8	57.3	25.9
6	60.6	17.3	65.2	22.7	60.1	24.0
7	60.0	22.6	65.1	22.9	57.4	24.7
8	59.4	22.7	62.6	22.9	58.1	19.9
9	60.5	20.0	63.2	21.2	58.3	23.8
10	62.0	18.6	64.1	20.1	59.1	24.2
11	62.0	18.0	63.8	19.0	59.6	22.7
12	59.4	20.6	64.1	18.8	59.0	22.9
13	57.0	25.4	59.0	23.0	58.4	23.8
14	60.0	19.5	61.2	20.5	57.2	24.6
15	62.5	22.4	61.6	21.7	59.0	24.0
16	63.0	20.6	60.2	20.5	58.2	24.3
17	60.0	23.3	61.8	20.3	57.7	24.7
18	60.5	23.1	61.5	21.2	58.2	24.2
19	63.4	23.0	59.6	22.2	59.5	24.7
20	62.4	23.1	61.4	23.9	61.0	24.6
21	61.8	22.7	60.2	20.5	61.4	23.8
22	60.5	23.0	60.2	23.1	60.2	24.0
23	63.2	21.7	60.0	22.9	59.4	24.0
24	63.9	22.1	61.8	22.7	59.0	24.2
25	64.2	22.0	59.2	25.0	58.8	24.2
26	63.4	23.3	58.0	25.1	58.8	24.3
27	61.1	24.0	57.5	25.0	60.0	23.0
28	60.5	23.9	58.3	22.1	59.8	22.6
29	58.7	24.2	58.7	20.4	59.9	23.1
30	61.4	24.3	60.3	18.3	58.7	23.9
31	61.1	24.3	61.0	18.7	0.0	0.0
MEANS	61.0	22.3	61.5	22.0	59.3	23.7
OBSVNS.	31	31	31	31	30	30
MAXIMUM	64.2	25.4	65.2	25.1	61.9	25.9
MINIMUM	57.0	17.3	57.5	18.3	57.2	19.9
STD.DEV.	1.71	1.95	2.19	1.94	1.30	1.20

SISTERS ISLAND 49 29 13 N 124 26 30 W

DATE	OCTOBER TEMP	OCTOBER SAL	NOVEMBER TEMP	NOVEMBER SAL	DECEMBER 1976 TEMP	DECEMBER 1976 SAL
1	57.7	24.6	49.6	28.1	46.7	29.0
2	56.8	24.6	49.4	27.8	46.4	29.1
3	56.7	24.8	49.8	28.1	46.3	28.8
4	56.5	25.1	49.9	28.2	45.7	28.9
5	55.7	25.6	49.8	28.2	46.0	29.0
6	56.8	25.8	49.5	28.8	46.1	29.4
7	56.5	25.4	49.4	28.4	46.2	29.1
8	54.3	26.3	49.5	28.6	46.7	29.4
9	53.5	27.4	49.4	28.6	46.5	29.4
10	54.0	26.9	49.1	28.1	46.6	29.5
11	53.2	26.8	48.9	28.5	46.7	29.4
12	53.4	26.3	48.6	28.0	46.5	28.9
13	54.0	26.3	48.7	28.2	46.7	29.4
14	54.0	26.5	48.7	28.2	47.0	29.0
15	53.0	26.5	49.0	28.9	47.0	29.1
16	53.0	27.4	49.0	28.6	47.2	28.9
17	52.5	27.3	49.0	28.5	47.5	29.0
18	52.5	26.4	48.6	28.4	46.6	28.5
19	53.0	26.8	48.6	28.2	46.5	28.1
20	52.0	26.8	48.5	28.2	46.5	28.8
21	52.8	26.9	48.5	28.2	46.4	28.9
22	51.8	27.3	48.5	28.2	46.5	29.1
23	51.2	27.3	48.2	28.2	46.3	28.9
24	50.8	27.7	48.2	28.5	45.2	28.4
25	50.5	27.8	48.0	28.4	46.0	29.1
26	50.0	28.0	47.5	28.2	46.5	29.1
27	50.0	28.1	46.6	28.4	45.6	29.1
28	50.0	28.0	47.0	28.4	45.6	29.3
29	50.1	27.6	47.0	28.5	45.1	29.7
30	49.9	28.1	46.8	28.2	45.9	29.5
31	50.2	28.4	0.0	0.0	45.2	29.1
MEANS	53.1	26.7	48.6	28.3	46.3	29.1
OBSVNS.	31	31	30	30	31	31
YRLY.MEANS....................................					51.6	26.4
MAXIMUM	57.7	28.4	49.9	28.9	47.5	29.7
MINIMUM	49.9	24.6	46.6	27.8	45.1	28.1
STD.DEV.	2.39	1.08	.91	.24	.57	.34

CHROME ISLAND 49 28 20 N 124 40 57 W

DATE	JANUARY TEMP	JANUARY SAL	FEBRUARY TEMP	FEBRUARY SAL	MARCH 1976 TEMP	MARCH 1976 SAL
1	44.1	27.6	44.9	28.0	43.2	28.9
2	44.5	28.1	44.5	28.6	43.5	28.6
3	44.9	28.1	45.0	28.1	42.8	29.4
4	45.5	29.3	44.5	28.1	42.3	29.5
5	45.5	29.5	43.6	28.9	42.8	29.5
6	45.7	29.3	44.0	28.8	42.7	29.4
7	45.5	29.5	43.7	28.9	43.2	29.4
8	45.4	28.5	44.5	28.8	43.1	29.1
9	45.0	29.7	44.3	29.4	43.2	28.9
10	45.2	28.5	44.3	29.5	44.2	29.7
11	45.1	28.4	45.1	29.3	44.7	29.5
12	44.4	29.0	44.3	28.2	44.4	29.3
13	44.2	29.3	45.0	29.4	44.2	28.8
14	44.8	29.3	45.0	28.9	44.5	28.6
15	44.9	29.3	45.1	28.9	44.3	28.8
16	45.0	28.8	45.7	29.5	44.5	28.9
17	45.0	28.0	45.6	29.3	44.8	29.4
18	44.5	27.8	45.7	29.0	45.0	29.4
19	44.0	28.2	45.4	30.0	44.9	28.9
20	44.2	28.1	44.8	29.5	45.1	30.3
21	44.3	28.1	45.0	29.5	45.5	29.8
22	44.5	28.2	45.2	30.0	45.6	29.5
23	43.7	28.9	45.4	30.3	45.5	30.2
24	44.2	28.5	45.5	29.7	46.0	30.4
25	43.8	27.8	45.2	29.8	44.5	26.9
26	44.9	28.6	45.1	29.3	45.7	30.2
27	45.1	29.3	43.5	29.4	46.0	30.0
28	45.7	29.1	40.6	28.8	45.8	30.2
29	45.8	28.6	43.8	29.5	45.5	30.2
30	45.5	28.8	0.0	0.0	45.5	30.4
31	45.4	28.8	0.0	0.0	45.7	29.7
MEANS	44.8	28.7	44.6	29.2	44.5	29.4
OBSVNS.	31	31	29	29	31	31
MAXIMUM	45.8	29.7	45.7	30.3	46.0	30.4
MINIMUM	43.7	27.6	40.6	28.0	42.3	26.9
STD.DEV.	.60	.58	1.00	.59	1.11	.72

CHROME ISLAND 49 28 20 N 124 40 57 W

	APRIL		MAY		JUNE	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.9	29.7	54.5	28.0	50.0	28.8
2	46.3	29.7	52.2	29.0	50.8	28.4
3	45.7	29.4	51.9	27.6	51.2	28.2
4	46.2	29.7	52.4	27.8	53.7	27.2
5	46.2	29.7	51.0	29.5	54.2	26.0
6	46.0	29.5	50.4	26.3	52.2	26.7
7	46.6	29.1	52.7	26.5	58.5	26.4
8	47.0	25.9	54.5	28.6	58.0	26.5
9	47.0	29.4	55.5	29.0	53.3	27.3
10	48.0	29.3	49.9	29.3	52.3	29.4
11	47.1	29.1	48.4	29.8	50.1	29.5
12	48.5	29.8	48.5	30.0	51.2	29.5
13	48.9	28.9	50.0	29.7	51.2	29.7
14	47.0	28.9	51.5	29.8	51.4	29.4
15	46.5	29.4	52.5	29.1	51.2	29.4
16	46.7	28.6	50.0	29.7	51.9	29.1
17	46.3	30.0	48.9	30.3	56.5	25.9
18	46.2	30.2	49.3	29.7	58.7	22.9
19	46.3	29.8	50.0	30.2	59.4	23.9
20	46.2	30.4	* 50.9	* 30.4	59.7	22.7
21	47.0	29.5	51.8	30.6	61.8	22.7
22	47.4	30.0	51.5	30.3	59.6	24.8
23	46.9	29.9	53.2	29.4	58.0	28.2
24	47.0	29.8	51.2	29.3	55.5	26.8
25	48.7	29.9	50.6	29.9	58.3	28.9
26	49.0	30.3	49.7	30.3	57.5	29.1
27	50.1	29.5	49.8	30.3	58.6	26.1
28	50.8	29.3	49.6	30.3	57.3	26.8
29	51.3	29.5	49.5	29.3	57.5	26.7
30	52.0	29.9	49.9	29.4	55.2	27.2
31	0.0	0.0	51.0	28.1	0.0	0.0
MEANS	47.5	29.5	51.1	29.2	55.2	27.1
OBSVNS.	30	30	30	30	30	30
MAXIMUM	52.0	30.4	55.5	30.6	61.8	29.7
MINIMUM	45.7	25.9	48.4	26.3	50.0	22.7
STD.DEV.	1.69	.80	1.80	1.10	3.55	2.12

CHROME ISLAND 49 28 20 N 124 40 57 W

DATE	JULY TEMP	JULY SAL	AUGUST TEMP	AUGUST SAL	SEPTEMBER 1976 TEMP	SEPTEMBER 1976 SAL
1	57.1	26.5	61.6	25.8	60.8	27.1
2	57.0	26.9	61.3	25.5	58.5	26.8
3	57.8	25.2	64.3	25.2	57.3	26.5
4	56.7	27.1	63.0	24.8	56.5	27.3
5	59.0	27.2	63.3	25.4	58.7	27.6
6	58.2	27.4	63.2	25.5	55.7	27.6
7	57.2	26.8	64.4	24.6	56.2	27.2
8	55.5	28.1	63.7	24.8	59.3	26.1
9	54.2	28.8	63.5	25.4	56.8	26.8
10	56.5	27.4	64.0	24.8	57.0	26.5
11	57.4	27.8	62.8	25.9	58.9	25.9
12	58.8	27.1	61.8	25.9	57.1	26.5
13	57.0	26.9	57.0	26.9	56.0	27.4
14	58.1	26.5	56.7	27.8	54.3	27.7
15	59.3	25.9	57.8	27.7	54.9	28.0
16	62.5	22.6	56.9	28.1	57.2	27.7
17	62.3	25.1	57.2	27.6	58.0	26.3
18	62.5	22.2	58.5	26.9	59.8	24.0
19	63.7	22.7	58.0	27.3	60.0	24.4
20	59.9	24.8	59.4	26.8	60.3	24.8
21	55.8	27.3	59.5	26.4	60.7	25.2
22	59.0	25.0	58.9	25.8	59.8	24.7
23	60.8	26.0	58.3	23.4	58.7	25.6
24	61.3	26.9	60.0	24.0	58.0	26.0
25	61.2	26.9	59.7	24.7	57.5	26.1
26	62.0	26.4	55.8	26.4	59.4	25.4
27	62.0	24.6	55.0	27.4	56.2	26.5
28	62.2	24.4	56.3	27.3	55.2	27.4
29	61.9	24.4	55.6	27.3	54.7	27.6
30	61.3	24.8	56.4	27.3	55.9	27.4
31	61.4	25.1	57.4	27.7	0.0	0.0
MEANS	59.7	26.0	59.8	26.1	57.6	26.5
OBSVNS.	31	31	31	31	30	30
MAXIMUM	63.7	28.8	64.4	28.1	60.8	28.0
MINIMUM	54.2	22.2	55.0	23.4	54.3	24.0
STD.DEV.	2.54	1.63	2.97	1.26	1.87	1.09

CHROME ISLAND 49 28 20 N 124 40 57 W

	OCTOBER		NOVEMBER		DECEMBER	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	56.6	27.6	49.5	29.4	46.7	28.9
2	56.5	27.3	49.3	29.3	46.4	28.6
3	57.2	26.0	49.8	28.9	46.5	28.8
4	57.5	25.9	50.1	28.1	46.3	28.9
5	55.6	27.3	50.2	28.9	46.2	28.6
6	55.8	27.2	50.0	29.1	46.5	28.6
7	55.1	27.4	49.7	28.6	46.8	28.8
8	53.8	27.8	50.0	28.0	47.7	29.0
9	53.7	28.0	49.8	28.1	47.0	29.0
10	52.3	28.2	49.9	28.6	47.3	29.4
11	51.3	28.8	49.5	28.5	47.7	29.1
12	51.3	29.7	49.3	28.9	47.7	29.3
13	52.0	29.4	49.2	28.6	47.3	29.4
14	52.7	29.8	48.5	28.0	47.5	29.4
15	52.6	27.8	49.2	28.9	47.7	29.4
16	53.2	28.5	49.2	29.7	48.0	29.7
17	53.0	27.8	49.2	30.0	48.2	29.9
18	52.8	27.7	48.9	28.9	46.7	27.8
19	53.0	28.4	49.0	29.4	46.8	29.7
20	52.7	28.2	48.3	29.3	47.0	28.6
21	53.0	28.4	48.5	28.9	47.0	28.9
22	52.8	28.0	48.5	29.1	47.2	29.8
23	52.6	28.1	48.4	29.5	46.6	29.4
24	50.4	29.7	48.3	29.5	46.4	29.1
25	50.4	29.8	48.2	30.2	46.8	29.0
26	50.2	29.8	47.8	30.3	47.3	29.1
27	49.8	30.2	47.2	29.7	46.6	29.3
28	49.2	30.4	47.2	29.4	46.0	28.5
29	50.1	29.1	47.0	29.0	42.7	19.9
30	49.3	29.3	46.5	28.6	44.8	25.6
31	49.5	30.2	0.0	0.0	46.0	29.0
MEANS	52.6	28.4	48.8	29.0	46.8	28.7
OBSVNS.	31	31	30	30	31	31
YRLY.MEANS..........					51.1	28.1
MAXIMUM	57.5	30.4	50.2	30.3	48.2	29.9
MINIMUM	49.2	25.9	46.5	28.0	42.7	19.9
STD.DEV.	2.38	1.18	.99	.61	1.02	1.80

DEPARTURE BAY 49 12 38 N 123 57 17 W

	JANUARY		FEBRUARY		MARCH	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	* 44.3	* 26.4	* 0.0	* 0.0	* 0.0	* 0.0
2	41.7	25.6	42.4	25.4	* 0.0	* 0.0
3	* 42.7	* 24.7	43.2	25.6	41.0	26.5
4	* 43.7	* 23.8	39.7	25.9	39.7	26.5
5	44.8	22.9	37.4	26.0	39.6	27.3
6	44.6	23.5	38.7	26.5	* 40.0	* 27.1
7	44.6	23.0	* 40.3	* 26.8	* 40.5	* 26.8
8	44.1	23.3	* 42.0	* 27.1	41.0	26.5
9	44.8	27.2	43.7	27.4	41.0	28.5
10	* 44.3	* 27.2	46.4	27.4	44.6	27.3
11	* 43.8	* 27.3	42.3	27.1	43.5	25.5
12	43.3	27.4	45.9	28.2	44.4	24.6
13	42.3	25.4	* 0.0	* 0.0	* 45.2	* 25.5
14	44.6	24.8	* 0.0	* 0.0	* 46.0	* 26.7
15	45.0	23.3	* 0.0	* 0.0	46.9	27.8
16	44.5	23.1	* 0.0	* 0.0	* 46.4	* 26.8
17	* 0.0	* 0.0	44.2	27.8	45.9	25.8
18	* 0.0	* 0.0	44.6	28.9	45.0	26.9
19	* 0.0	* 0.0	45.0	28.4	44.6	28.0
20	41.9	25.4	45.3	28.2	* 44.6	* 27.2
21	42.7	25.6	* 45.6	* 27.9	* 44.6	* 26.3
22	41.4	25.4	* 46.3	* 27.6	44.6	25.4
23	41.9	25.9	45.8	27.3	42.8	26.9
24	41.7	27.4	44.6	27.1	45.1	25.0
25	* 41.4	* 26.8	46.2	27.3	46.9	28.8
26	41.0	26.1	41.2	26.5	47.8	27.4
27	45.5	26.9	43.5	25.4	* 47.9	* 27.7
28	48.6	28.1	* 0.0	* 0.0	* 48.0	* 28.1
29	48.7	28.1	* 0.0	* 0.0	48.2	28.5
30	* 0.0	* 0.0	0.0	0.0	48.9	25.0
31	* 0.0	* 0.0	0.0	0.0	50.9	28.5
MEANS	43.9	25.4	43.4	27.0	44.7	26.9
OBSVNS.	20	20	18	18	20	20
MAXIMUM	48.7	28.1	46.9	28.9	50.9	28.8
MINIMUM	41.0	22.9	37.4	25.4	39.6	24.6
STD.DEV.	2.17	1.76	2.76	1.07	3.15	1.32

DEPARTURE BAY 49 12 38 N 123 57 17 W

	APRIL		MAY		JUNE	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.6	27.1	* 57.1	* 27.1	48.7	27.7
2	45.1	26.8	* 54.7	* 27.7	51.4	18.2
3	* 45.5	* 26.9	52.3	28.4	51.6	15.6
4	* 45.9	* 27.0	53.6	25.0	53.6	17.4
5	46.4	27.1	50.4	27.8	* 56.1	* 19.0
6	48.6	25.8	51.4	28.8	* 58.7	* 20.7
7	* 48.9	* 26.8	51.3	26.3	61.3	22.4
8	49.3	27.8	* 51.4	* 26.0	61.7	23.8
9	49.6	25.8	* 51.6	* 25.7	60.1	26.9
10	* 49.7	* 26.2	51.8	25.4	60.8	28.4
11	* 49.8	* 26.6	53.2	27.8	* 0.0	* 0.0
12	50.0	27.1	54.1	26.3	* 0.0	* 0.0
13	54.5	29.1	* 0.0	* 0.0	* 0.0	* 0.0
14	46.7	26.3	* 0.0	* 0.0	55.6	24.0
15	51.4	28.9	* 0.0	* 0.0	57.2	25.2
16	* 0.0	* 0.0	* 0.0	* 0.0	55.9	26.5
17	* 0.0	* 0.0	52.2	26.9	57.6	24.0
18	* 0.0	* 0.0	50.0	26.9	59.9	23.5
19	* 0.0	* 0.0	51.3	27.1	* 61.5	* 22.3
20	50.0	27.2	54.3	26.3	* 63.2	* 21.0
21	50.9	27.8	53.6	25.6	64.9	19.7
22	50.3	27.7	* 0.0	* 0.0	64.4	21.3
23	50.0	27.8	* 0.0	* 0.0	63.9	22.5
24	* 50.9	* 27.4	* 0.0	* 0.0	59.0	23.0
25	* 51.9	* 27.0	55.0	25.0	63.0	23.7
26	52.9	26.5	51.1	26.1	* 62.5	* 24.0
27	55.4	26.9	51.8	29.0	* 61.9	* 24.7
28	59.0	28.2	52.9	26.5	61.3	24.6
29	55.0	26.1	* 51.1	* 27.3	60.8	23.3
30	59.5	26.5	* 49.3	* 28.2	59.0	22.2
31	0.0	0.0	47.5	29.1	0.0	0.0
MEANS	51.1	27.2	52.1	26.9	58.7	23.0
OBSVNS.	19	19	18	18	21	21
MAXIMUM	59.5	29.1	55.0	29.1	64.9	28.4
MINIMUM	44.6	25.8	47.5	25.0	48.7	15.6
STD.DEV.	4.11	.94	1.80	1.32	4.49	3.24

DEPARTURE BAY 49 12 38 N 123 57 17 W

	JULY		AUGUST		SEPTEMBER 1976	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	* 58.1	* 23.8	* 0.0	* 0.0	* 64.0	* 19.1
2	57.2	25.5	* 0.0	* 0.0	64.4	18.3
3	* 58.3	* 26.3	63.3	25.1	63.3	20.9
4	59.5	27.1	60.8	25.9	* 0.0	* 0.0
5	60.8	28.6	62.2	26.3	* 0.0	* 0.0
6	61.2	25.4	64.4	21.4	* 0.0	* 0.0
7	61.3	25.2	* 65.0	* 21.4	61.9	19.7
8	60.8	25.9	* 65.6	* 21.5	57.2	17.0
9	* 0.0	* 0.0	66.2	21.6	60.8	14.4
10	* 0.0	* 0.0	61.3	25.1	59.0	17.8
11	* 0.0	* 0.0	61.2	24.6	* 58.4	* 19.3
12	* 0.0	* 0.0	61.0	24.6	* 57.8	* 20.9
13	61.7	21.2	60.3	22.5	57.2	22.5
14	61.3	16.7	* 59.9	* 22.3	58.1	26.7
15	64.4	14.8	* 59.5	* 22.0	59.0	17.5
16	66.2	19.0	59.0	21.7	59.0	17.8
17	* 65.9	* 19.4	61.2	23.0	59.0	18.6
18	* 65.6	* 19.8	64.6	19.7	* 60.5	* 19.1
19	65.3	20.3	* 62.5	* 22.5	* 62.0	* 19.7
20	* 63.3	* 22.5	60.3	25.4	63.5	20.3
21	61.3	24.8	* 60.7	* 22.5	59.9	23.1
22	60.8	25.6	* 61.1	* 19.6	59.0	24.3
23	61.2	27.1	61.5	16.7	58.1	24.3
24	* 62.8	* 23.6	61.2	26.7	55.4	26.5
25	* 64.5	* 20.1	56.7	23.5	* 56.0	* 25.5
26	66.2	16.6	59.0	20.4	* 56.6	* 24.5
27	63.3	16.2	58.3	23.5	57.2	23.5
28	64.4	18.4	* 59.7	* 21.5	56.3	24.6
29	62.6	20.9	* 61.1	* 19.5	57.2	25.4
30	61.7	23.0	62.6	17.4	57.2	25.4
31	* 0.0	* 0.0	63.7	19.9	0.0	0.0
MEANS	62.7	22.2	61.4	22.8	59.1	21.4
OBSVNS.	19	19	20	20	20	20
MAXIMUM	66.2	28.6	66.2	26.7	64.4	26.7
MINIMUM	57.2	14.8	56.7	16.7	55.4	14.4
STD.DEV.	2.31	4.31	2.29	2.87	2.49	3.65

DEPARTURE BAY 49 12 36 N 123 57 17 W

	OCTOBER		NOVEMBER		DECEMBER	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	57.4	22.1	* 0.0	* 0.0	* 48.2	* 27.2
2	* 58.5	* 23.0	52.3	23.0	48.2	27.1
3	* 59.6	* 23.9	52.9	25.1	48.2	29.4
4	60.8	24.8	53.9	25.6	* 47.0	* 29.1
5	* 62.0	* 26.2	53.6	26.4	* 45.8	* 28.8
6	63.3	27.7	* 52.7	* 26.4	44.6	28.4
7	60.1	25.6	* 51.7	* 26.4	46.4	27.8
8	55.4	27.8	51.7	26.4	50.0	28.9
9	* 0.0	* 0.0	51.5	26.7	46.4	29.0
10	* 0.0	* 0.0	50.0	27.2	48.2	29.7
11	* 0.0	* 0.0	50.0	27.2	* 48.2	* 29.4
12	52.2	27.4	* 0.0	* 0.0	* 48.2	* 29.1
13	51.8	26.1	* 0.0	* 0.0	48.2	28.8
14	54.1	26.1	* 0.0	* 0.0	48.2	28.6
15	54.5	25.0	50.5	28.8	48.2	29.1
16	* 56.6	* 25.1	48.2	27.3	49.1	28.9
17	* 58.7	* 25.3	49.1	28.9	49.1	28.6
18	60.8	25.5	49.1	28.6	* 48.8	* 28.6
19	* 59.9	* 25.9	* 0.0	* 0.0	* 48.5	* 28.6
20	59.0	26.3	* 0.0	* 0.0	48.2	28.6
21	54.1	25.0	* 0.0	* 0.0	48.2	28.1
22	51.8	25.8	49.1	29.3	48.2	27.8
23	* 51.8	* 26.0	47.1	28.8	48.2	27.8
24	* 51.8	* 26.2	48.2	28.4	44.6	26.0
25	51.8	26.4	47.3	27.8	* 0.0	* 0.0
26	50.0	28.1	44.6	27.1	* 0.0	* 0.0
27	50.5	28.5	* 46.5	* 27.7	* 0.0	* 0.0
28	* 50.4	* 28.6	* 48.4	* 28.4	* 0.0	* 0.0
29	50.2	28.8	51.4	29.1	44.6	26.8
30	* 0.0	* 0.0	49.2	27.3	45.5	27.2
31	* 0.0	* 0.0	0.0	0.0	42.8	26.4
MEANS	55.2	26.3	49.6	27.3	47.3	28.2
OBSVNS.	17	17	19	19	20	20
YRLY.MEANS........					52.4	25.3
MAXIMUM	63.3	28.8	53.6	29.3	50.0	29.7
MINIMUM	50.0	22.1	44.6	23.0	42.8	26.0
STD.DEV.	4.27	1.67	2.15	1.59	1.90	1.02

ENTRANCE ISLAND 49 12 34 N 123 48 27 N

	JANUARY		FEBRUARY		MARCH	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	42.2	25.5	43.0	23.4	42.0	25.6
2	41.5	25.4	42.6	25.8	43.2	27.6
3	44.5	27.3	43.0	26.4	41.1	26.1
4	46.3	28.4	42.7	26.0	40.7	25.8
5	46.0	28.5	42.7	26.1	41.3	26.7
6	45.6	27.4	41.5	26.3	41.7	27.2
7	45.9	28.8	41.7	26.1	42.6	27.1
8	44.5	27.4	43.8	27.3	42.3	26.8
9	42.7	25.1	44.0	27.7	42.5	26.4
10	45.1	27.7	43.7	27.2	43.9	28.1
11	43.9	26.9	45.0	28.0	43.7	28.1
12	42.3	25.9	45.7	28.9	43.6	28.0
13	43.2	26.8	45.1	28.2	43.6	27.8
14	44.0	27.4	45.8	28.5	43.4	27.7
15	44.5	27.6	45.3	28.6	43.3	27.8
16	43.5	26.1	46.2	29.0	43.7	27.7
17	42.6	24.8	45.7	28.9	43.9	27.8
18	42.6	25.2	46.0	28.8	44.2	27.8
19	42.5	25.4	45.3	28.4	43.6	27.8
20	43.0	26.7	43.9	28.8	44.5	28.2
21	42.5	26.3	44.3	28.1	44.8	28.2
22	42.8	26.3	45.2	28.2	45.5	28.9
23	43.5	26.9	44.5	27.6	45.3	28.5
24	42.6	26.4	43.7	26.9	45.9	28.9
25	42.2	25.8	43.3	26.7	45.0	28.5
26	43.8	27.2	43.5	26.9	45.3	28.9
27	44.9	27.3	44.1	27.7	45.6	29.0
28	45.4	28.2	43.2	27.2	45.5	29.0
29	45.0	27.6	44.0	27.2	44.7	28.1
30	43.8	26.3	0.0	0.0	45.3	28.5
31	43.8	25.9	0.0	0.0	45.4	28.6
MEANS	43.8	26.7	44.1	27.4	43.8	27.8
OBSVNS.	31	31	29	29	31	31
MAXIMUM	46.3	28.8	46.2	29.0	45.9	29.0
MINIMUM	41.5	24.8	41.5	23.4	40.7	25.6
STD.DEV.	1.30	1.07	1.27	1.26	1.46	.93

ENTRANCE ISLAND 49 12 34 N 123 48 27 N

	APRIL		MAY		JUNE	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	44.7	27.2	52.6	27.7	50.7	25.8
2	45.0	27.3	52.0	26.4	53.4	19.0
3	45.7	27.3	52.8	27.8	53.8	16.2
4	45.4	27.3	49.9	27.7	53.6	18.7
5	45.6	26.8	48.0	28.1	56.5	16.6
6	46.2	27.6	51.5	27.6	55.8	22.1
7	46.3	28.1	53.5	26.8	56.3	23.1
8	47.7	27.3	54.5	26.7	57.5	22.7
9	47.6	27.6	55.5	26.8	* 54.5	* 24.9
10	48.0	27.3	53.2	27.1	51.4	27.1
11	49.0	27.4	52.3	26.9	50.5	27.6
12	48.9	27.4	49.7	27.8	50.0	27.8
13	48.4	27.6	53.2	27.3	49.8	23.0
14	47.8	28.0	54.2	26.1	48.2	25.9
15	46.5	28.1	55.6	26.3	50.2	27.4
16	46.3	28.2	53.7	26.1	55.6	25.0
17	46.2	28.2	52.6	26.5	54.2	25.5
18	45.9	28.1	52.8	26.7	58.0	21.4
19	46.1	28.2	52.5	26.4	58.2	18.2
20	46.1	28.5	54.0	23.8	58.8	19.9
21	46.4	28.5	53.5	25.6	61.6	19.0
22	48.6	27.2	53.6	26.7	61.4	19.9
23	47.0	28.1	54.5	26.9	58.8	22.4
24	47.2	28.5	51.5	27.4	57.5	23.7
25	48.8	29.4	53.7	27.8	58.5	20.3
26	48.4	27.6	48.0	28.6	60.1	21.7
27	49.0	27.3	51.3	26.8	60.8	22.4
28	50.3	26.9	48.6	28.9	58.0	23.8
29	57.5	27.1	47.2	29.0	60.0	19.4
30	52.2	27.7	48.0	28.8	57.2	24.2
31	0.0	0.0	49.0	27.8	0.0	0.0
MEANS	47.6	27.7	51.9	27.1	55.7	22.4
OBSVNS.	30	30	31	31	29	29
MAXIMUM	57.5	29.4	55.6	29.0	61.6	27.8
MINIMUM	44.7	26.8	47.2	23.8	48.2	16.2
STD.DEV.	2.50	.58	2.35	1.06	3.89	3.30

ENTRANCE ISLAND 49 12 34 N 123 48 27 N

	JULY		AUGUST		SEPTEMBER 1976	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	58.0	24.2	60.7	24.2	62.8	15.8
2	58.1	25.0	62.2	23.8	62.5	17.4
3	56.7	25.1	60.0	24.4	60.0	20.9
4	59.3	27.4	58.0	25.8	53.3	26.5
5	58.4	26.3	57.5	26.3	54.2	26.5
6	52.6	24.8	62.9	19.7	58.5	18.8
7	57.5	26.0	62.7	15.8	58.8	20.3
8	55.0	26.7	62.9	18.4	61.8	13.1
9	54.5	27.4	60.0	23.7	61.2	17.5
10	58.1	25.6	60.0	24.6	63.5	14.1
11	63.2	17.9	56.3	26.1	60.8	16.5
12	59.4	22.9	59.8	24.6	56.8	23.7
13	59.0	22.1	59.0	24.0	54.6	25.2
14	62.9	15.0	57.2	25.2	54.0	26.1
15	62.3	12.7	57.7	25.4	57.8	17.4
16	63.9	12.7	59.6	19.0	58.8	19.4
17	62.3	19.6	57.2	24.2	59.3	19.6
18	64.0	19.9	61.2	19.5	59.8	19.2
19	63.8	20.4	58.6	22.0	60.0	20.1
20	62.3	23.1	57.8	25.0	60.3	21.6
21	60.5	22.9	60.3	19.1	61.5	22.6
22	57.7	24.3	59.6	14.4	58.6	23.4
23	61.4	22.0	60.0	14.0	57.7	24.3
24	65.6	15.7	59.8	21.2	57.7	24.4
25	62.1	11.9	61.0	19.6	60.7	22.7
26	64.8	14.9	59.0	22.6	59.3	22.2
27	62.4	19.2	55.0	25.6	60.0	20.9
28	62.7	20.3	57.3	25.6	57.6	24.6
29	62.3	22.1	59.2	19.6	58.2	23.9
30	63.0	22.1	60.8	15.3	58.0	21.6
31	61.4	22.5	61.6	17.3	0.0	0.0
MEANS	60.5	21.4	59.5	21.8	58.9	21.0
OBSVNS.	31	31	31	31	30	30
MAXIMUM	65.6	27.4	62.9	26.3	63.5	26.5
MINIMUM	52.6	11.9	55.0	14.0	53.3	13.1
STD.DEV.	3.22	4.51	1.96	3.77	2.57	3.61

ENTRANCE ISLAND 49 12 34 N 123 48 27 N

	OCTOBER		NOVEMBER		DECEMBER 1976	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	58.5	21.0	49.0	25.9	46.0	27.2
2	57.3	21.7	49.5	28.1	45.7	27.2
3	55.4	23.0	49.3	24.0	45.6	27.2
4	57.2	23.9	49.0	22.5	45.0	26.8
5	54.2	25.1	49.5	22.6	45.5	27.3
6	55.4	26.1	49.8	26.0	46.7	28.0
7	55.3	23.7	49.3	26.0	47.6	28.5
8	55.0	23.9	49.8	26.9	* 46.6	* 27.7
9	54.1	25.2	50.0	26.5	45.5	26.8
10	53.3	26.1	49.5	26.9	46.2	27.7
11	53.3	25.8	49.5	27.1	47.8	28.9
12	55.9	23.3	49.6	26.9	47.5	29.1
13	54.8	24.3	49.0	26.7	46.6	29.0
14	53.6	25.4	49.1	26.9	46.8	29.0
15	54.0	24.3	49.0	27.7	47.9	29.1
16	53.7	25.1	48.9	28.5	47.9	29.1
17	* 53.6	* 25.1	48.8	28.6	48.2	29.4
18	53.5	25.1	46.4	28.2	47.5	28.9
19	53.8	25.1	47.5	28.5	45.5	25.6
20	52.9	26.0	48.4	28.1	45.4	26.3
21	52.8	25.9	47.9	28.1	46.8	28.1
22	52.5	25.9	47.8	28.2	47.2	28.5
23	52.0	25.9	47.7	28.2	46.7	28.1
24	50.9	27.4	48.0	28.2	45.0	26.8
25	49.5	28.0	47.5	27.2	46.0	27.7
26	49.4	28.2	47.5	26.7	47.5	29.0
27	49.0	28.8	45.3	27.2	45.6	26.8
28	49.7	28.6	45.8	26.7	44.7	26.4
29	49.5	28.1	46.4	27.1	45.6	27.4
30	49.5	28.6	46.5	27.3	45.3	27.3
31	48.8	28.8	0.0	0.0	44.3	26.5
MEANS	53.1	25.6	48.4	26.9	46.3	27.8
OBSVNS.	30	30	30	30	30	[illegible]
YRLY.MEANS..					51.2	25.3
MAXIMUM	58.5	28.8	50.0	28.8	48.2	29.4
MINIMUM	48.8	21.0	45.8	22.5	44.3	25.5
STD.DEV.	2.67	2.07	1.22	1.55	1.09	1.06

ACTIVE PASS 48 52 26 N 123 17 23 W

DATE	JANUARY TEMP	JANUARY SAL	FEBRUARY TEMP	FEBRUARY SAL	MARCH TEMP	MARCH SAL 1976
1	43.8	26.8	43.2	23.1	42.3	28.0
2	42.3	26.9	43.2	24.8	41.6	28.0
3	44.5	27.7	42.8	24.8	41.2	28.4
4	45.6	28.0	42.3	24.6	42.2	28.0
5	45.5	28.6	43.0	26.9	41.8	27.3
6	45.0	29.0	41.8	27.1	43.0	28.1
7	44.5	29.0	42.3	26.4	43.2	28.5
8	45.2	29.4	42.7	26.4	42.4	27.2
9	44.1	29.0	42.6	26.7	43.3	27.7
10	44.8	28.8	43.7	26.9	43.8	27.8
11	44.9	28.5	44.8	27.8	44.4	27.7
12	43.9	27.4	44.8	27.4	44.2	28.2
13	43.6	26.8	45.2	28.1	44.5	27.4
14	45.6	28.1	45.3	28.5	44.8	26.9
15	45.2	27.8	45.1	28.4	44.9	28.4
16	45.2	27.2	44.8	28.1	44.8	28.5
17	44.7	26.5	44.8	28.6	43.9	27.7
18	42.2	21.8	44.8	28.9	44.1	27.8
19	42.3	23.0	44.3	28.5	43.7	28.4
20	42.3	23.8	43.6	28.2	43.9	28.5
21	42.2	25.8	44.4	27.2	44.0	28.1
22	43.3	26.4	44.2	26.5	44.3	28.8
23	41.6	25.9	44.7	27.4	44.8	28.5
24	41.6	24.7	44.8	28.1	46.0	29.5
25	42.2	24.8	45.2	28.9	45.8	29.1
26	43.9	27.3	45.3	28.5	46.0	29.1
27	45.5	28.4	44.8	28.6	46.4	29.5
28	45.8	28.6	44.8	28.5	45.7	28.8
29	45.1	28.4	43.1	28.0	45.3	29.0
30	45.1	28.1	0.0	0.0	45.9	28.9
31	43.5	23.3	0.0	0.0	45.7	29.1
MEANS	44.0	27.0	44.0	27.3	44.1	28.3
OBSVNS.	31	31	29	29	31	31
MAXIMUM	45.8	29.4	45.3	28.9	46.4	29.5
MINIMUM	41.6	21.8	41.8	23.1	41.2	26.9
STD.DEV.	1.35	1.99	1.07	1.46	1.42	.67

ACTIVE PASS 48 52 26 N 123 17 23 W

	APRIL		MAY		JUNE	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	45.6	28.8	49.3	14.9	49.1	29.1
2	44.1	28.6	* 49.3	* 21.3	49.9	28.9
3	44.2	28.9	49.3	27.8	51.6	25.4
4	45.4	26.9	48.5	28.5	54.5	11.8
5	45.8	26.1	48.4	27.8	53.6	20.1
6	46.2	28.2	51.9	16.5	55.8	11.4
7	45.8	28.1	51.3	22.9	59.7	19.9
8	48.3	20.3	53.4	27.3	54.3	25.0
9	47.8	28.4	52.3	28.5	50.6	28.6
10	50.0	23.1	50.2	28.6	51.6	29.0
11	47.2	27.2	50.0	28.6	49.8	29.4
12	49.7	26.9	48.1	29.4	51.0	29.0
13	49.7	23.5	51.7	12.2	51.3	28.9
14	45.7	28.9	55.3	17.1	49.6	29.3
15	47.2	28.1	57.8	24.4	49.6	29.0
16	45.2	28.8	50.6	27.2	52.2	25.4
17	45.7	28.8	49.7	28.8	52.6	27.2
18	45.7	29.1	49.6	26.5	51.0	27.4
19	46.3	29.0	51.0	12.4	60.2	9.8
20	46.2	29.0	53.7	19.0	59.4	13.9
21	47.1	26.9	53.4	25.8	60.8	19.5
22	48.7	24.0	50.7	27.8	60.6	17.8
23	46.7	29.3	51.6	26.9	55.7	24.7
24	49.3	29.7	49.7	28.9	58.8	7.3
25	50.1	23.8	50.1	28.8	60.0	11.9
26	49.3	23.8	49.2	29.1	60.2	15.2
27	49.5	26.8	51.6	28.9	59.7	16.5
28	51.2	27.2	49.2	29.8	59.8	17.4
29	51.2	27.2	48.1	29.8	57.3	19.7
30	51.2	28.5	49.7	30.0	49.5	25.9
31	0.0	0.0	48.8	29.4	0.0	0.0
MEANS	47.5	27.1	50.7	25.5	54.7	21.9
OBSVNS.	30	30	30	30	30	30
MAXIMUM	51.2	29.7	55.3	30.0	60.8	29.4
MINIMUM	44.1	20.3	48.1	12.2	49.1	7.3
STD.DEV.	2.14	2.31	1.88	5.48	4.27	7.08

ACTIVE PASS 48 52 26 N 123 17 23 W

	JULY		AUGUST		SEPTEMBER 1976	
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	51.8	26.8	59.2	22.6	59.0	20.0
2	55.3	28.0	56.2	25.5	56.9	24.0
3	52.2	27.1	54.8	25.1	54.5	26.0
4	53.4	28.0	55.8	27.6	54.1	26.3
5	52.3	27.8	54.1	27.7	52.4	28.2
6	55.0	27.3	61.4	18.4	57.0	19.5
7	53.8	28.9	55.6	22.1	56.2	27.2
8	51.2	28.9	55.0	25.4	61.0	10.3
9	53.2	28.6	55.7	26.1	61.3	8.1
10	54.0	28.9	56.2	26.5	58.8	17.6
11	56.8	17.0	55.1	28.0	55.2	26.1
12	55.7	24.3	54.3	27.4	53.8	26.0
13	54.3	28.4	53.0	27.7	54.0	25.9
14	62.2	8.1	52.8	28.8	57.8	14.9
15	66.0	10.8	61.0	10.5	57.1	9.3
16	60.6	19.9	54.2	27.2	58.8	16.6
17	54.2	9.8	53.6	25.8	58.2	18.0
18	61.3	20.6	54.7	28.2	59.5	18.8
19	63.4	17.5	53.7	25.6	60.1	16.3
20	58.8	24.3	55.2	27.6	62.2	15.3
21	57.3	24.6	59.1	23.3	59.4	22.1
22	56.9	24.6	60.2	11.5	54.4	25.6
23	58.7	25.1	56.5	21.6	53.5	27.1
24	53.5	16.6	58.8	20.3	55.6	24.7
25	60.2	20.1	57.7	20.9	52.5	27.6
26	65.2	5.8	55.0	25.2	54.0	26.0
27	65.6	12.4	53.0	26.7	54.6	25.8
28	63.2	16.9	57.2	23.5	52.1	26.8
29	58.3	21.3	57.9	17.9	52.1	27.4
30	61.4	21.3	55.0	25.6	56.8	13.3
31	59.7	24.2	57.8	19.0	0.0	0.0
MEANS	58.2	21.7	56.2	23.8	56.4	21.4
OBSVNS.	31	31	31	31	30	30
MAXIMUM	66.0	28.9	61.4	28.8	62.2	28.2
MINIMUM	51.2	5.8	52.8	10.5	52.1	8.1
STD.DEV.	4.54	6.79	2.35	4.59	2.93	6.13

ACTIVE PASS 48 52 26 N 123 17 23 W

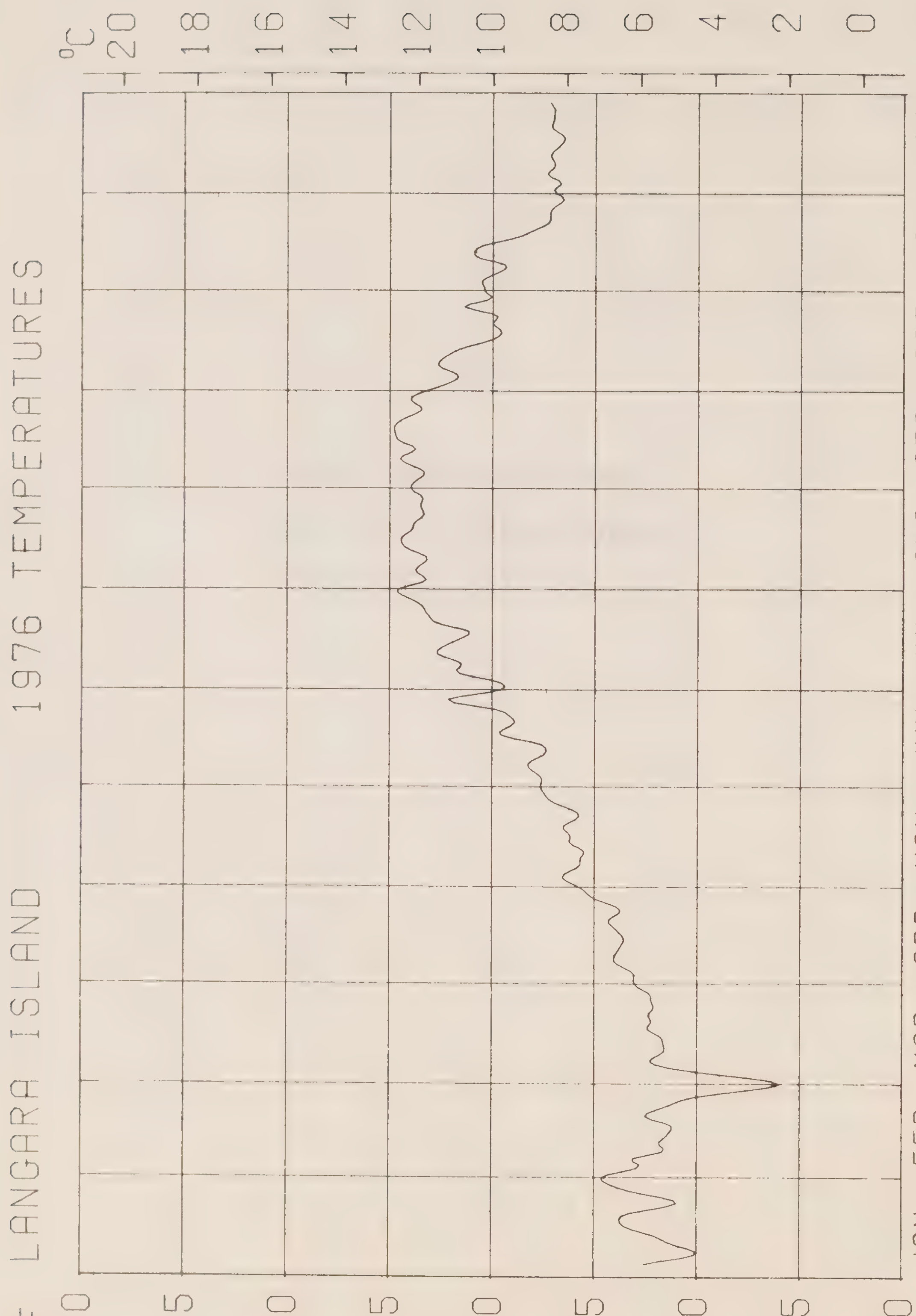
	OCTOBER		NOVEMBER		DECEMBER	1976
DATE	TEMP	SAL	TEMP	SAL	TEMP	SAL
1	57.3	17.8	49.3	28.6	46.3	26.9
2	55.5	24.6	49.1	26.3	46.2	26.4
3	57.1	22.5	49.8	24.8	46.3	27.1
4	55.5	24.7	49.4	24.6	45.8	26.7
5	53.3	26.9	49.3	23.5	46.4	28.2
6	53.2	26.8	49.3	22.7	47.3	28.6
7	55.5	18.0	49.1	26.8	47.7	29.0
8	53.8	25.2	* 49.2	* 26.1	47.6	29.8
9	53.8	25.8	49.3	25.4	47.2	29.7
10	51.0	27.8	48.5	21.8	47.0	29.5
11	51.0	28.8	48.5	23.5	47.2	29.8
12	51.0	28.1	48.1	23.7	46.2	29.3
13	52.8	20.4	47.5	24.2	46.8	29.4
14	53.4	14.1	48.2	25.5	46.8	27.4
15	54.0	19.5	48.8	27.7	47.8	28.0
16	52.8	20.6	50.0	28.5	47.7	29.0
17	53.2	23.0	* 49.3	* 28.3	47.7	28.6
18	53.6	24.7	48.6	28.1	46.4	28.4
19	53.6	24.3	48.3	29.0	46.1	28.9
20	52.4	25.2	47.7	26.4	47.0	28.5
21	51.5	23.5	48.1	26.5	47.[illegible]	28.4
22	51.0	25.9	47.8	27.7	46.9	29.0
23	51.2	26.5	48.0	27.2	46.7	29.1
24	50.0	27.7	48.0	28.9	46.2	29.3
25	49.2	29.0	* 47.8	* 28.2	46.6	29.5
26	49.2	29.0	47.5	27.4	46.9	28.9
27	49.2	29.0	46.5	28.8	45.6	27.4
28	49.4	28.4	45.8	28.2	44.2	26.4
29	48.7	28.8	45.8	27.3	45.2	27.2
30	49.3	28.8	45.3	24.4	43.2	19.2
31	50.0	29.1	0.0	0.0	44.1	23.7
MEANS	52.3	25.0	48.2	26.2	46.5	27.9
OBSVNS.	31	31	27	27	31	31
YRLY.MEANS					50.3	25.3
MAXIMUM	57.3	29.1	50.0	29.0	47.8	29.8
MINIMUM	48.7	14.1	45.3	21.8	43.2	19.2
STD.DEV.	2.40	3.91	1.22	2.10	1.10	2.09

Annual Graphs of the 7-day

Normally-weighted Running Means

for Temperature and Salinity

1976


LANGARA ISLAND 1976 TEMPERATURES
°F
70
65
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°C
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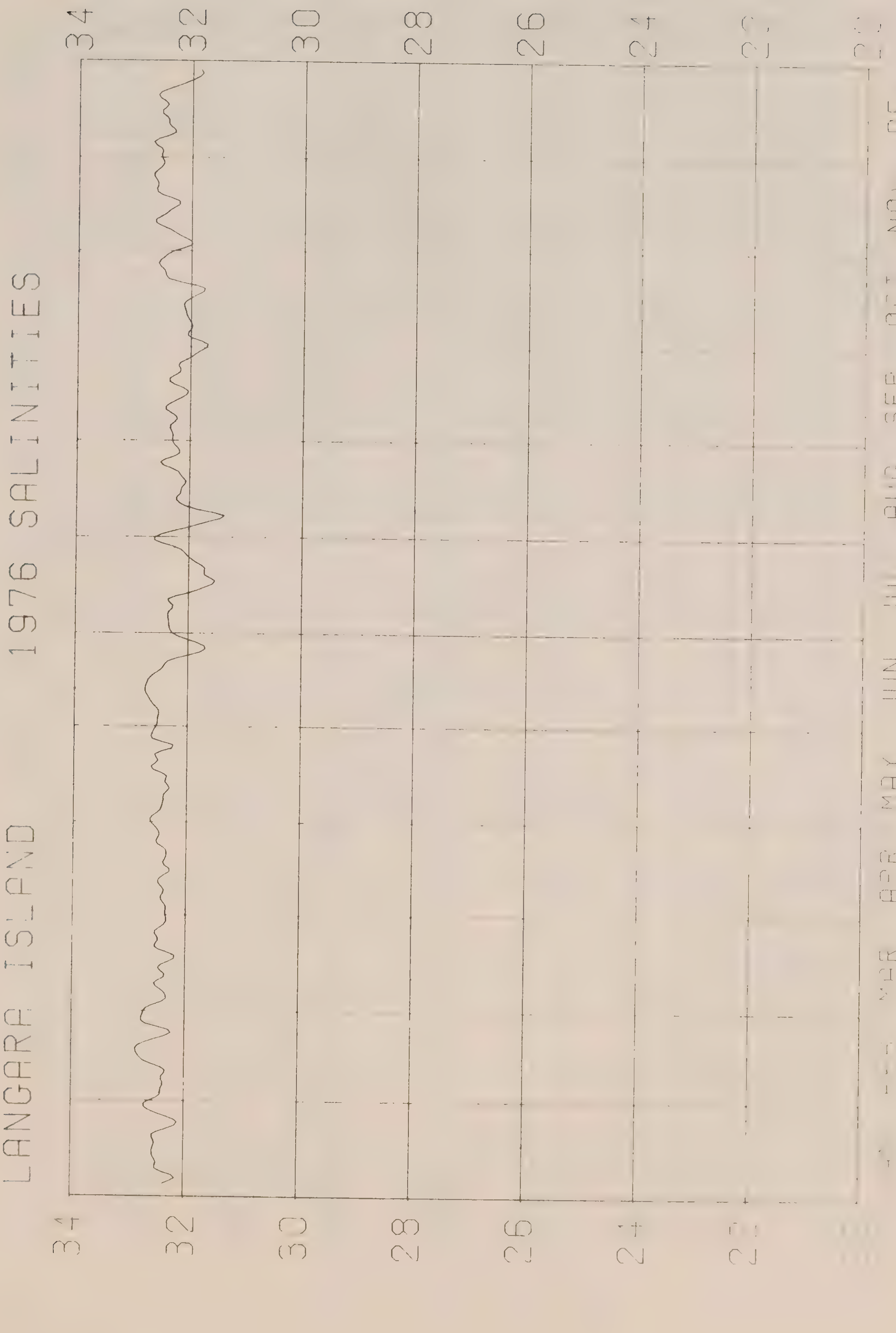
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC


LANGARA ISLAND 1976 SALINITIES
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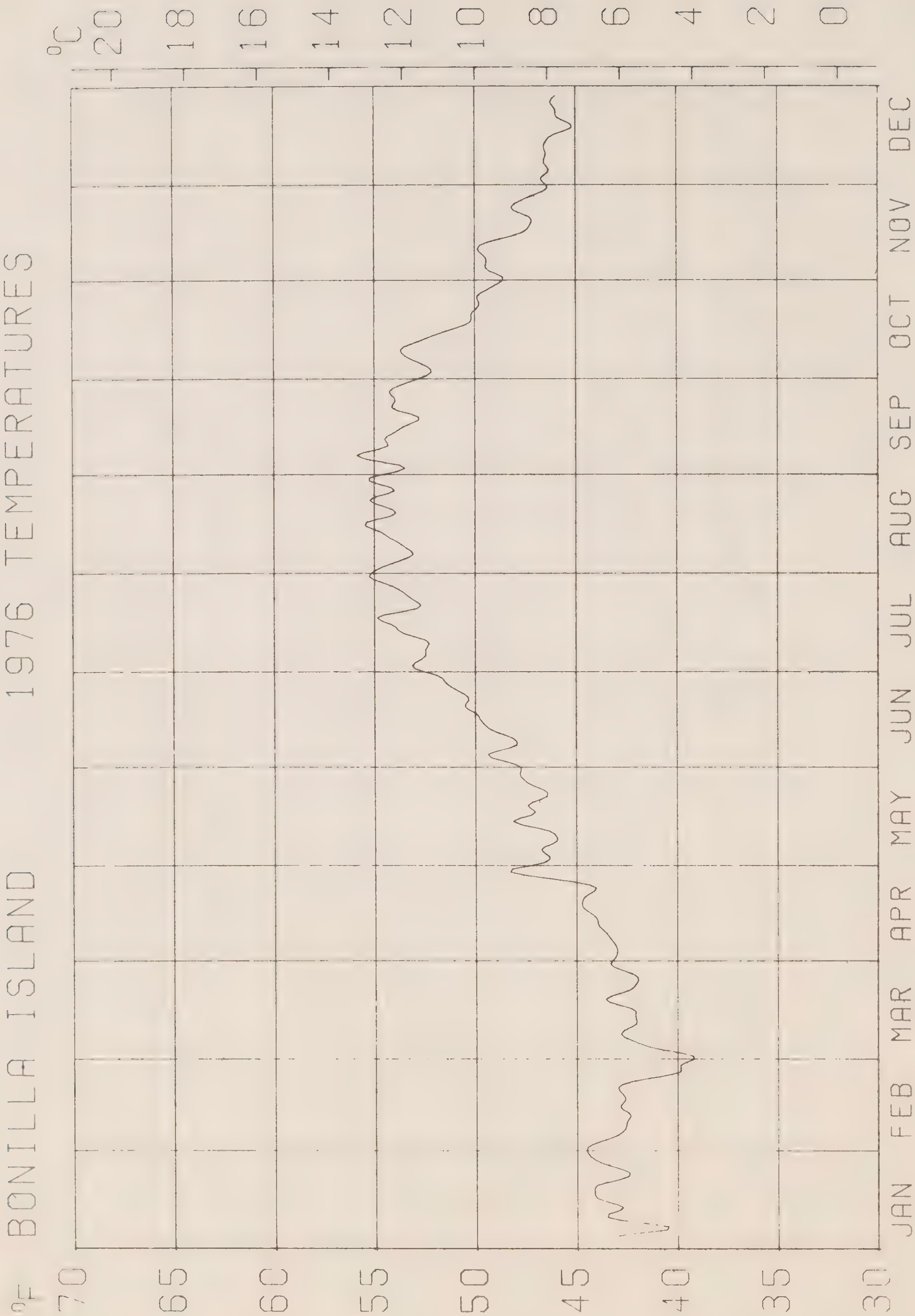
NOV


BONILLA ISLAND 1976 TEMPERATURES
°F
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°C
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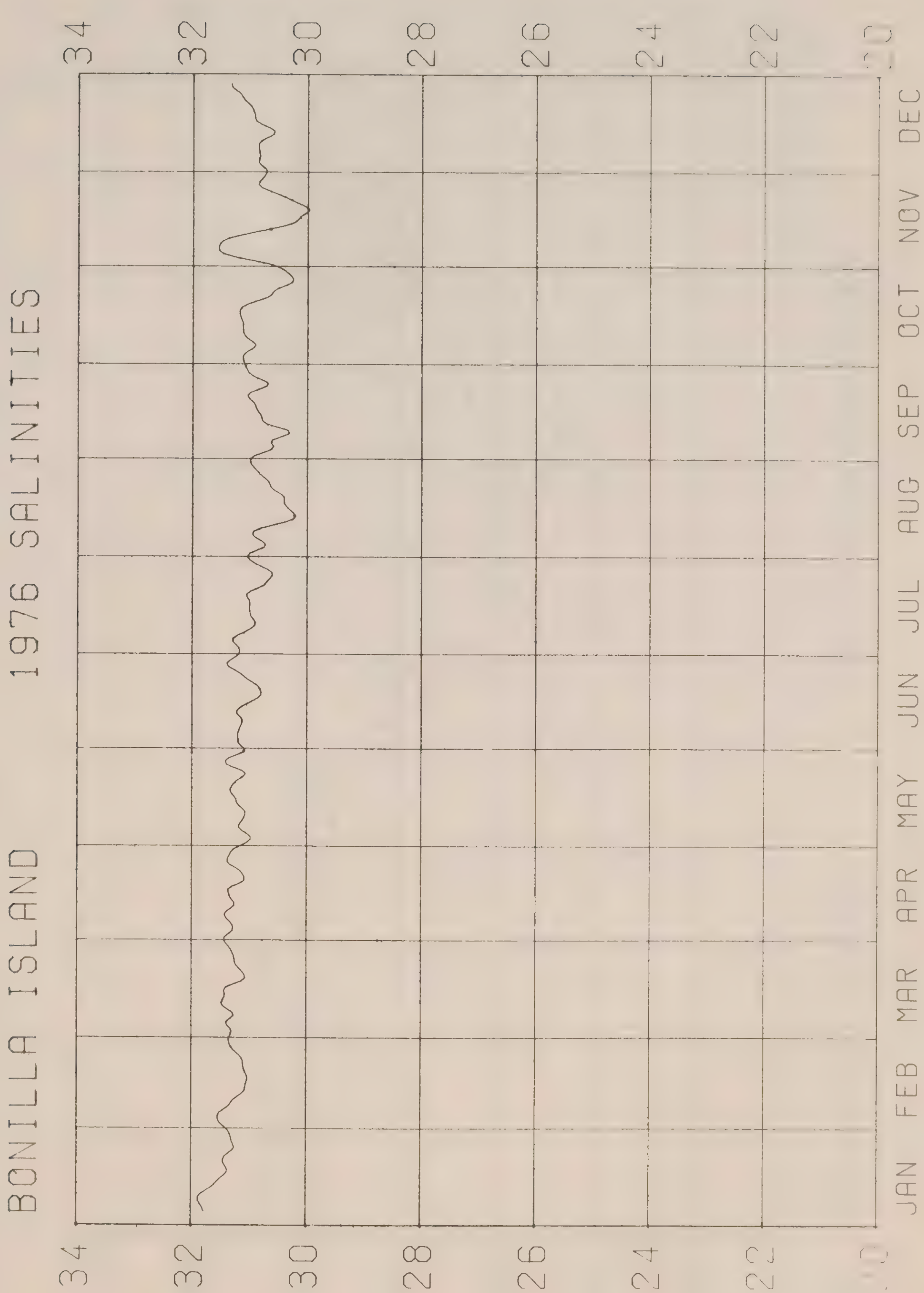
DEC


BONILLA ISLAND 1976 SALINITIES
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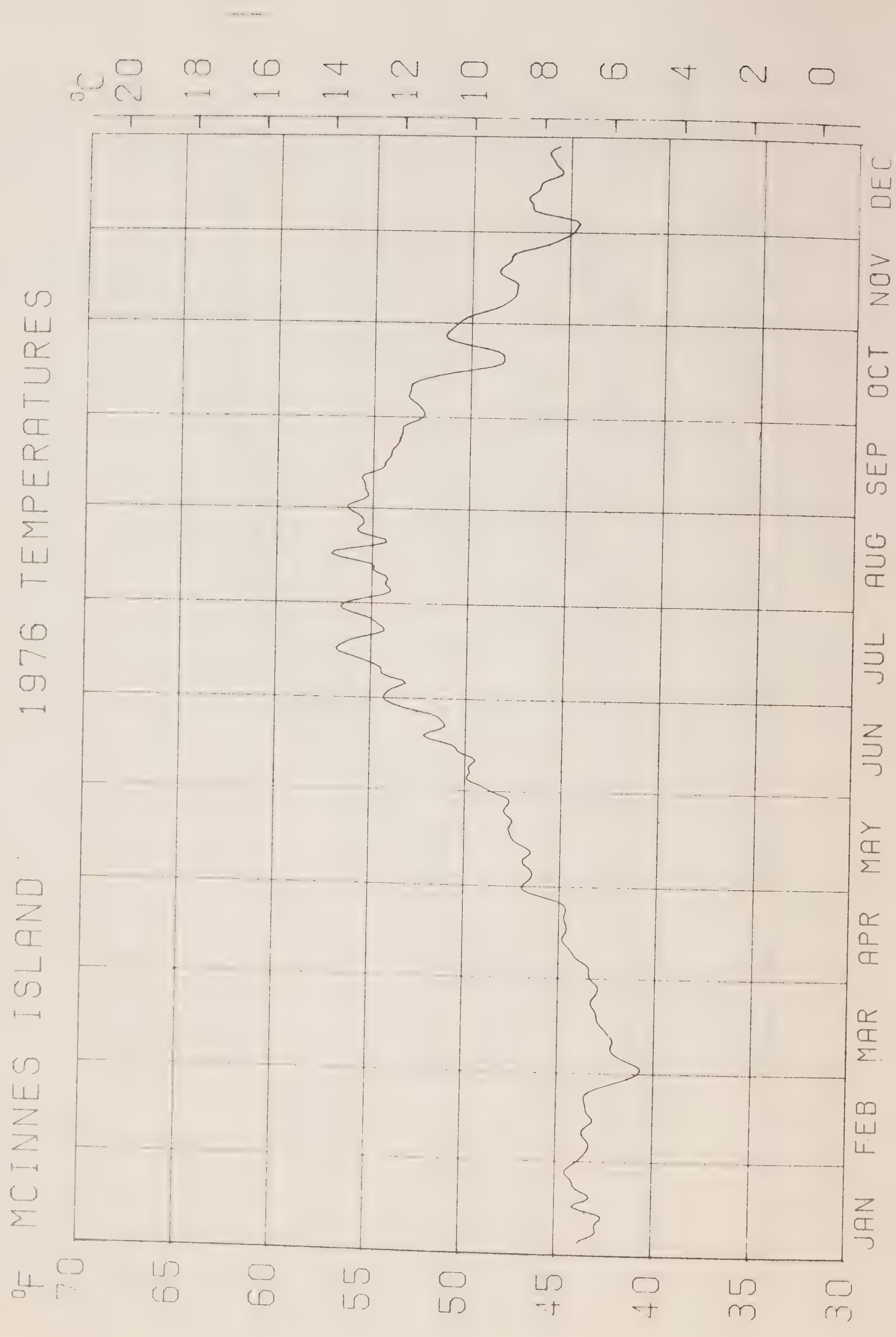
MCINNES ISLAND 1976 TEMPERATURES
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°C
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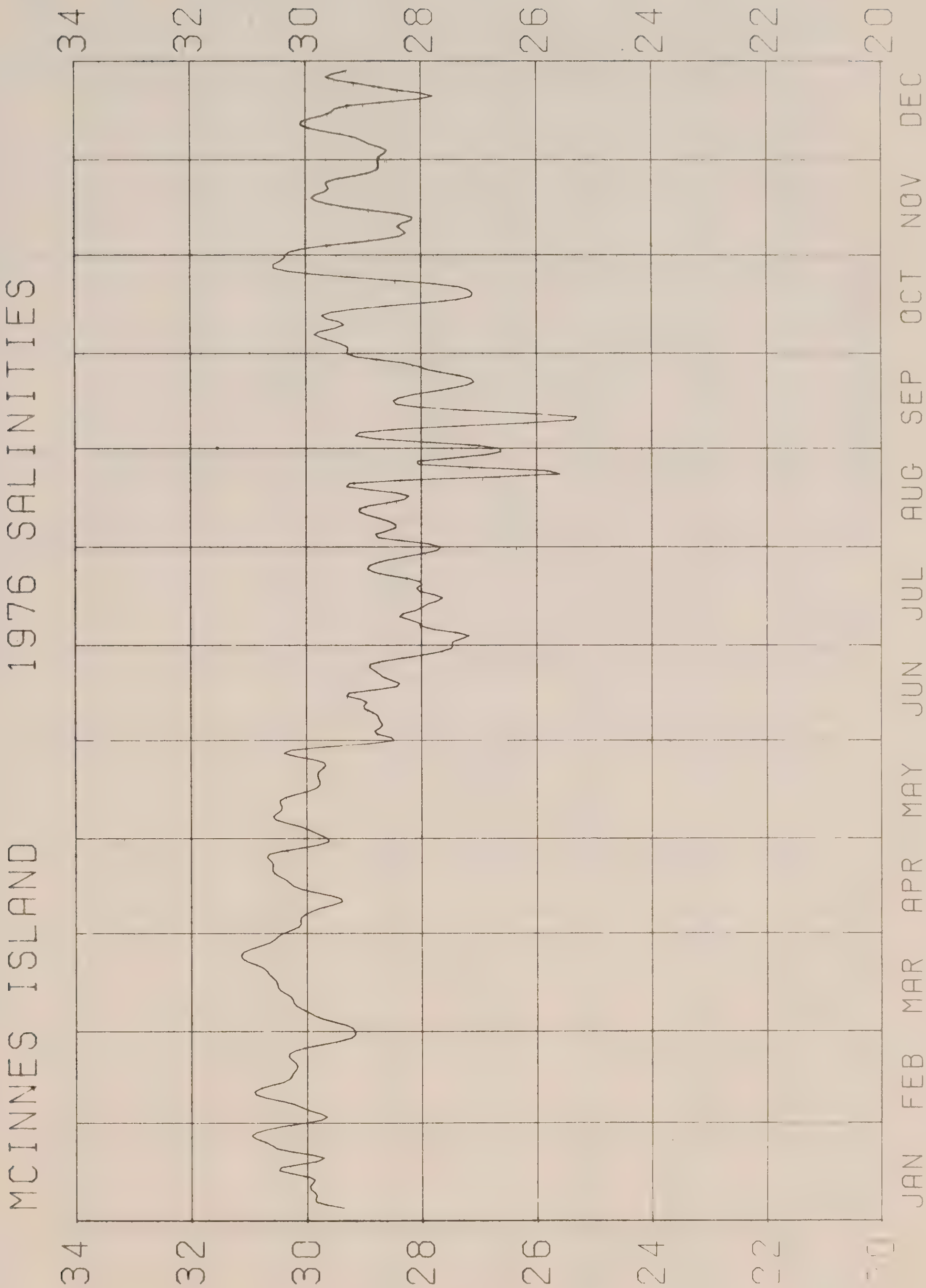
DEC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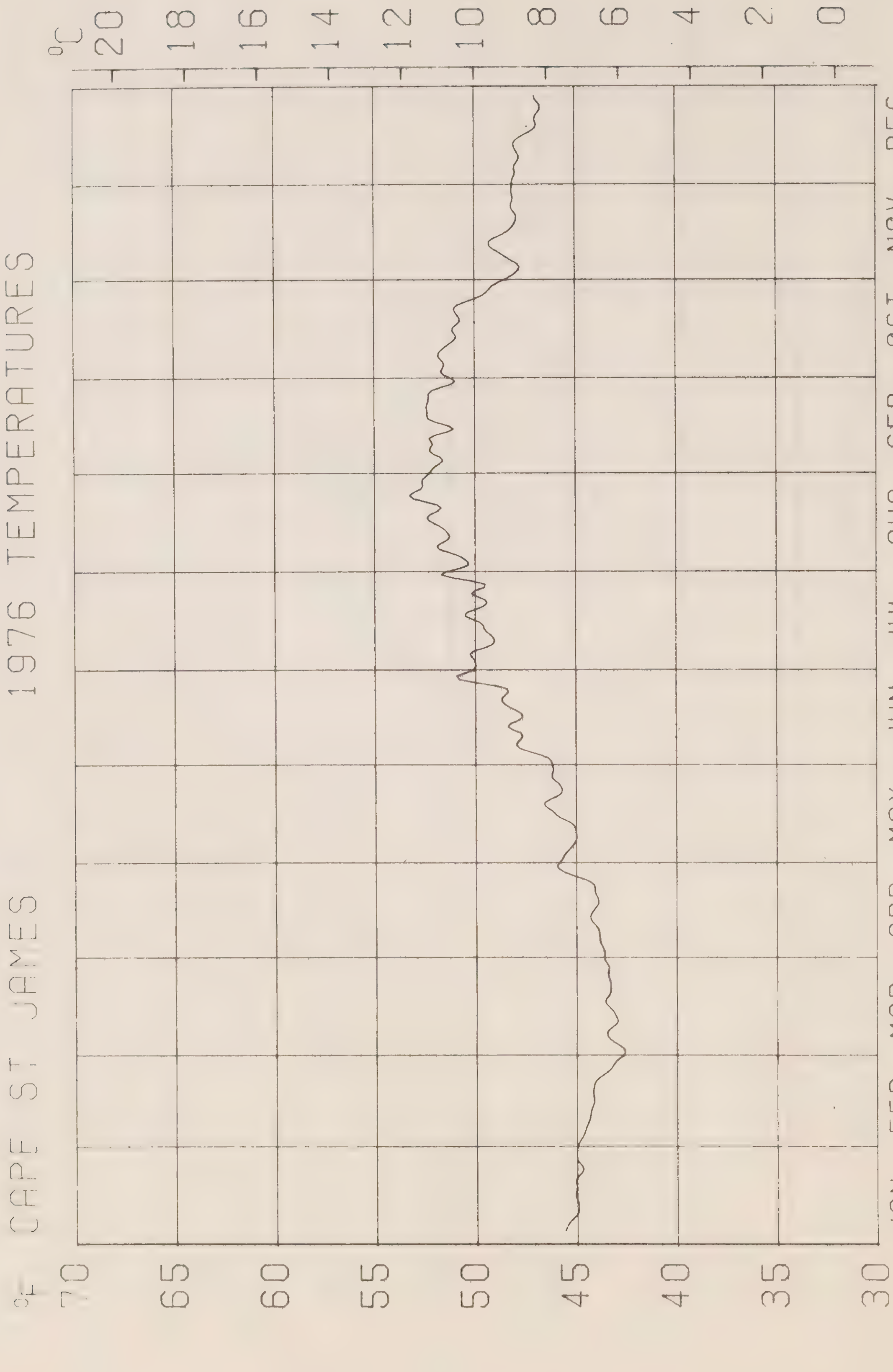
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC


CAPE ST. JAMES 1976 TEMPERATURES
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
°F
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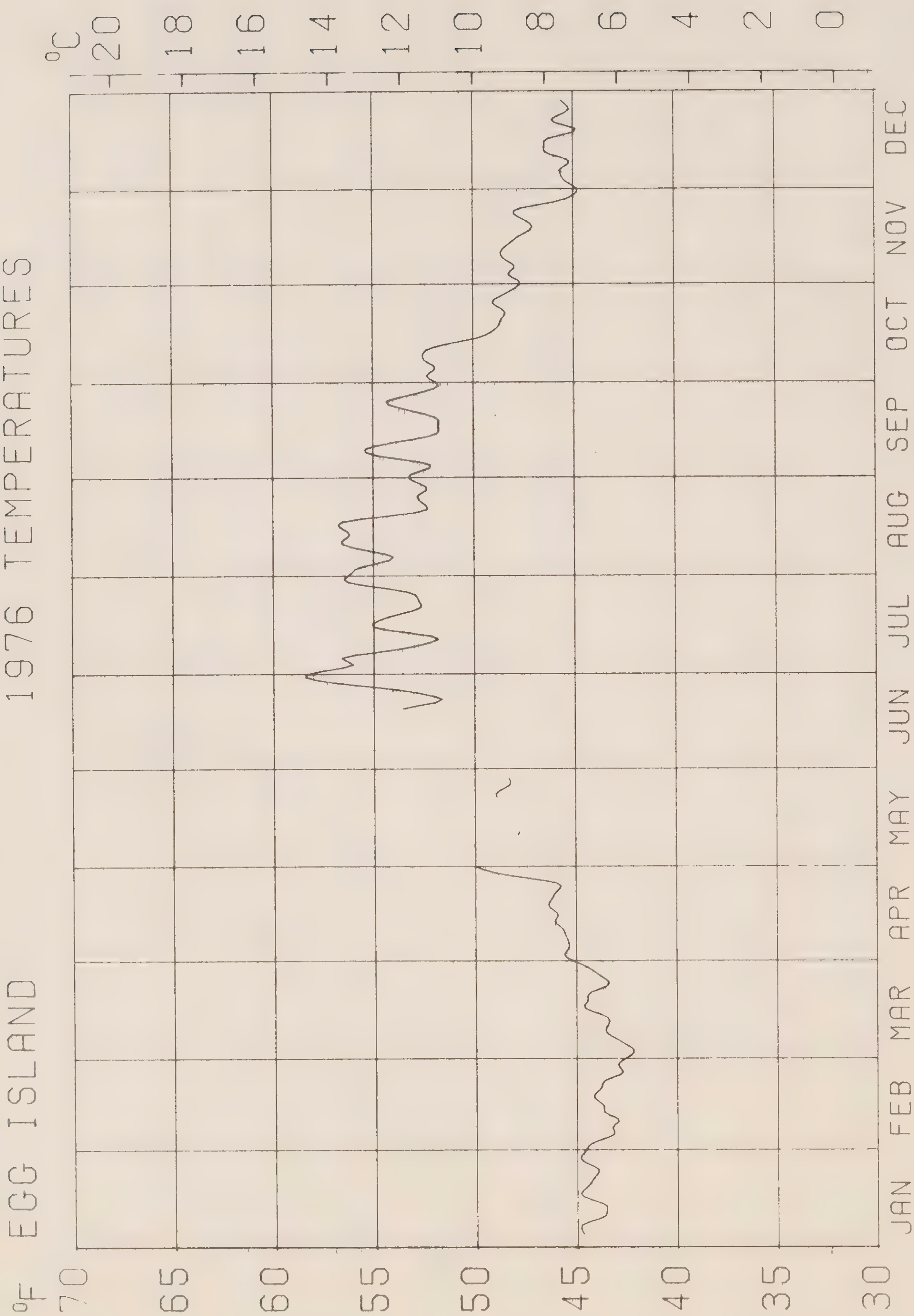

EGG ISLAND
1976 TEMPERATURES
°F
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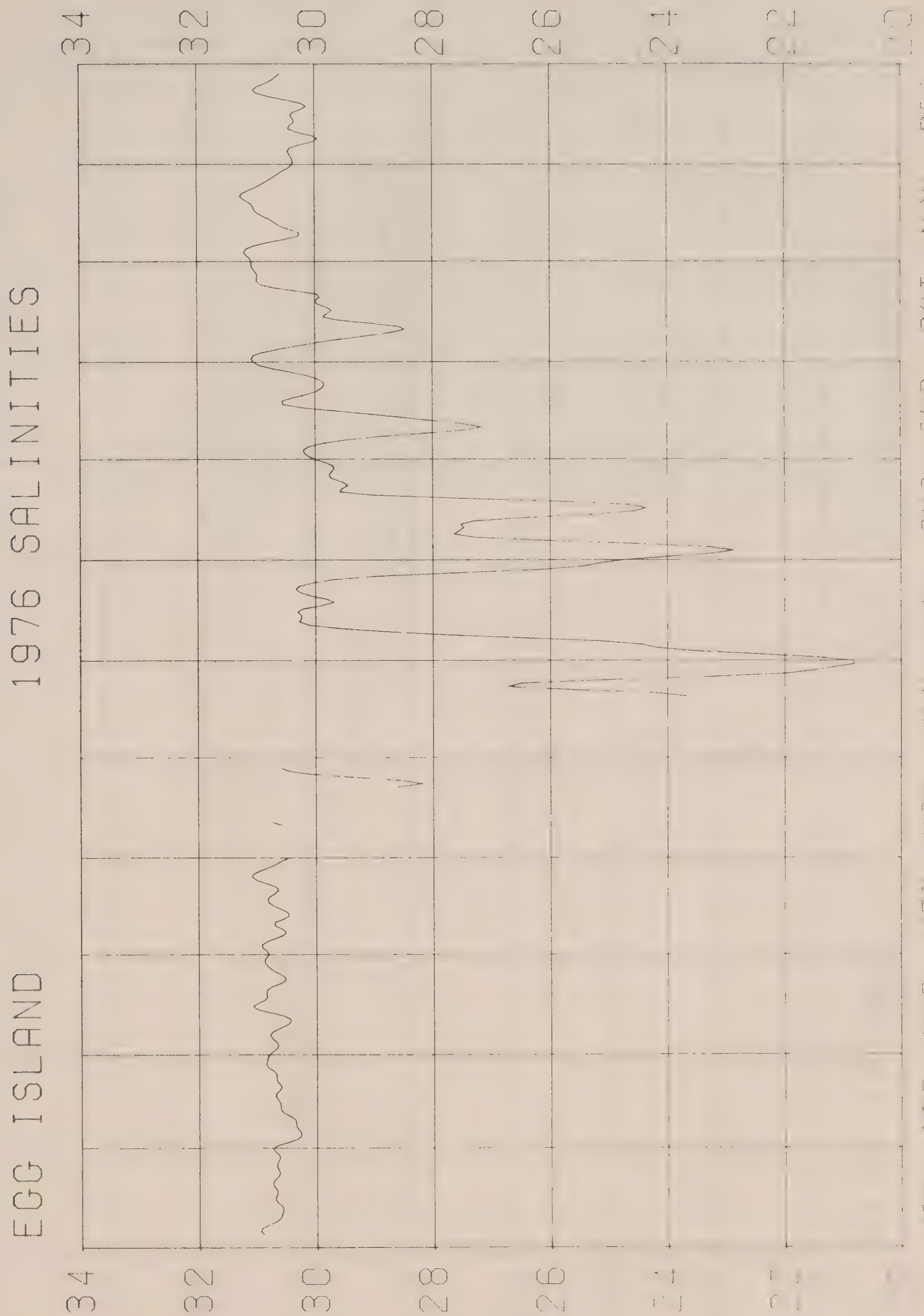
EGG ISLAND 1976 SALINITIES
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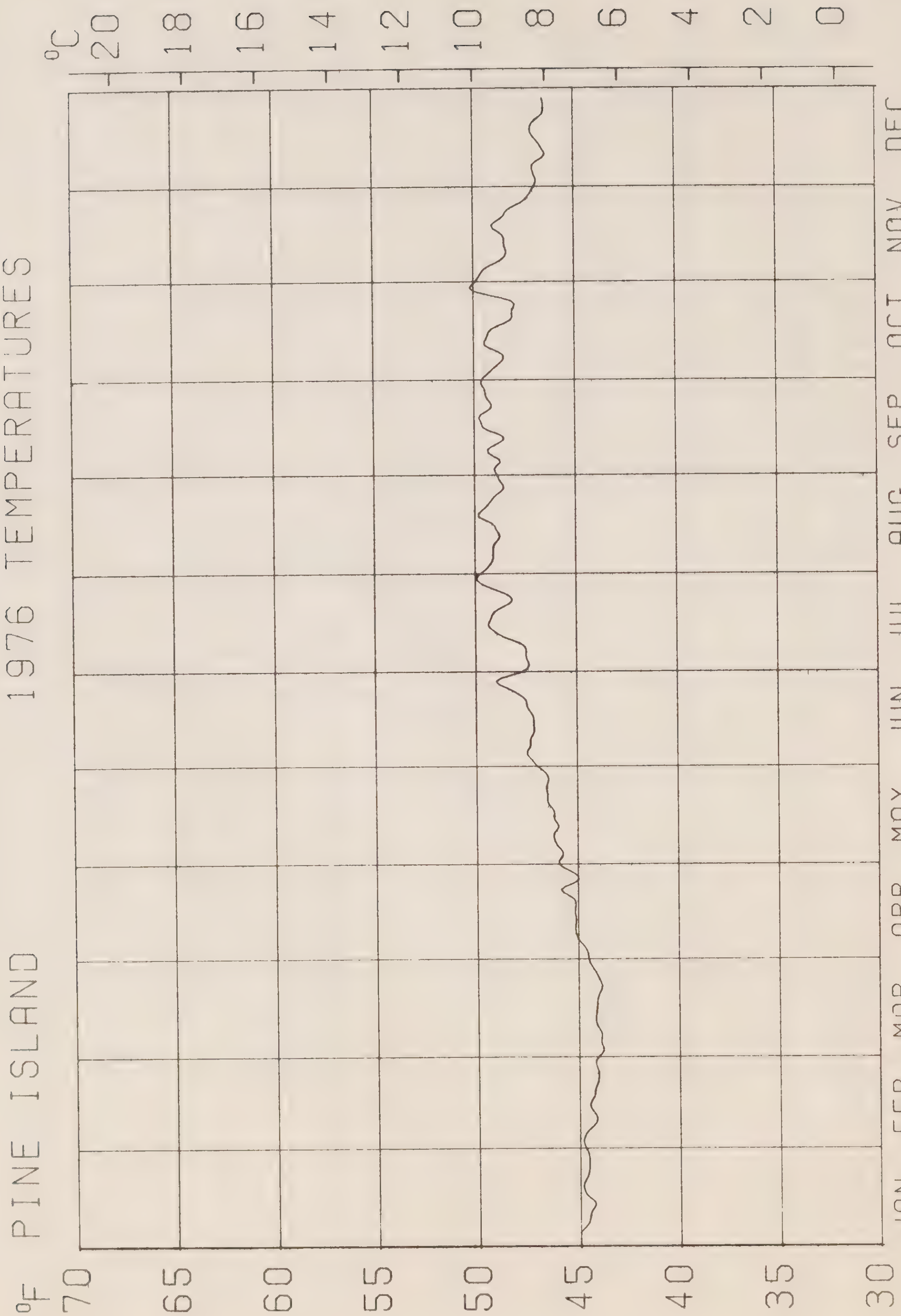
PINE ISLAND 1976 TEMPERATURES
°F
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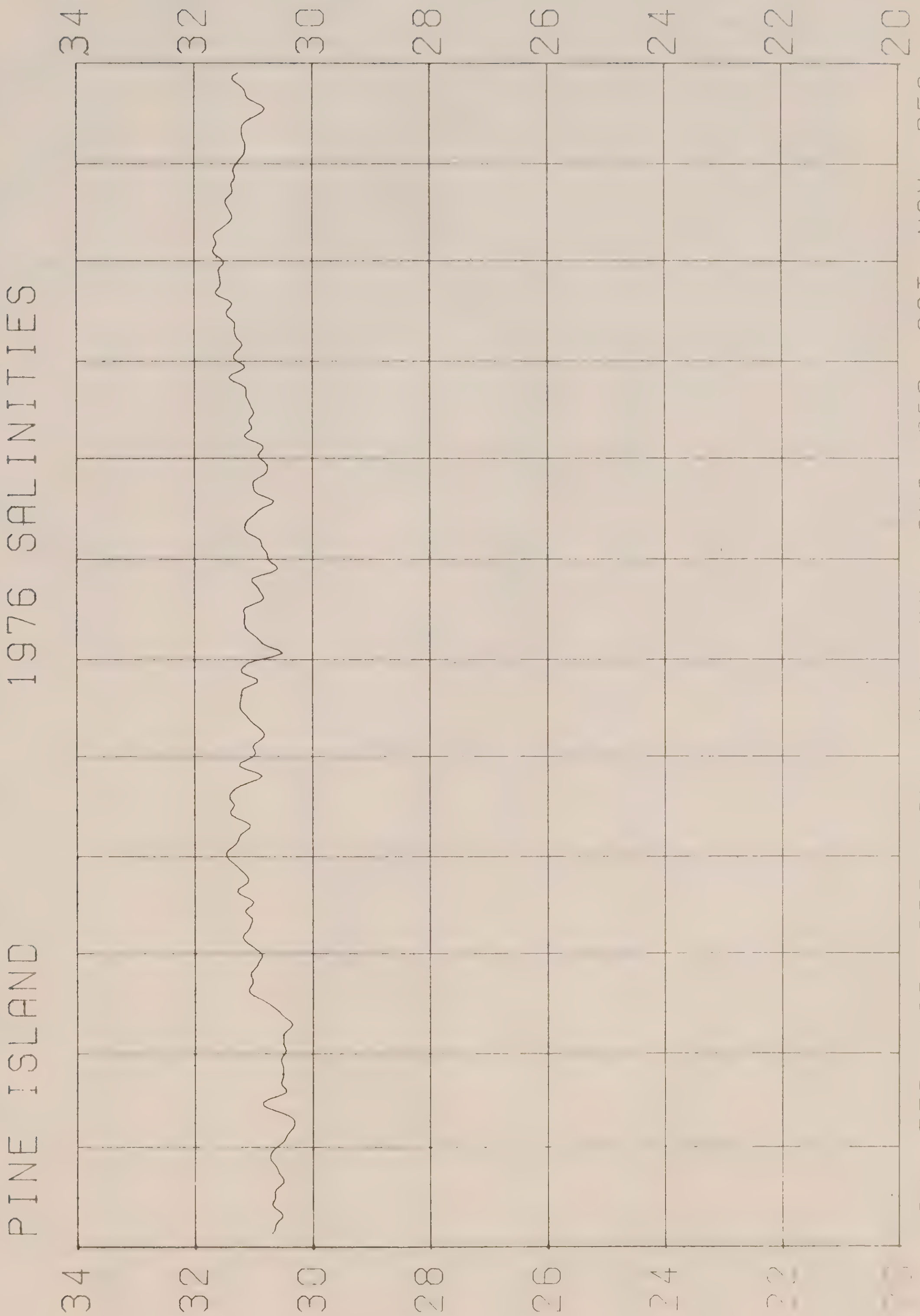
PINE ISLAND
1976 SALINITIES
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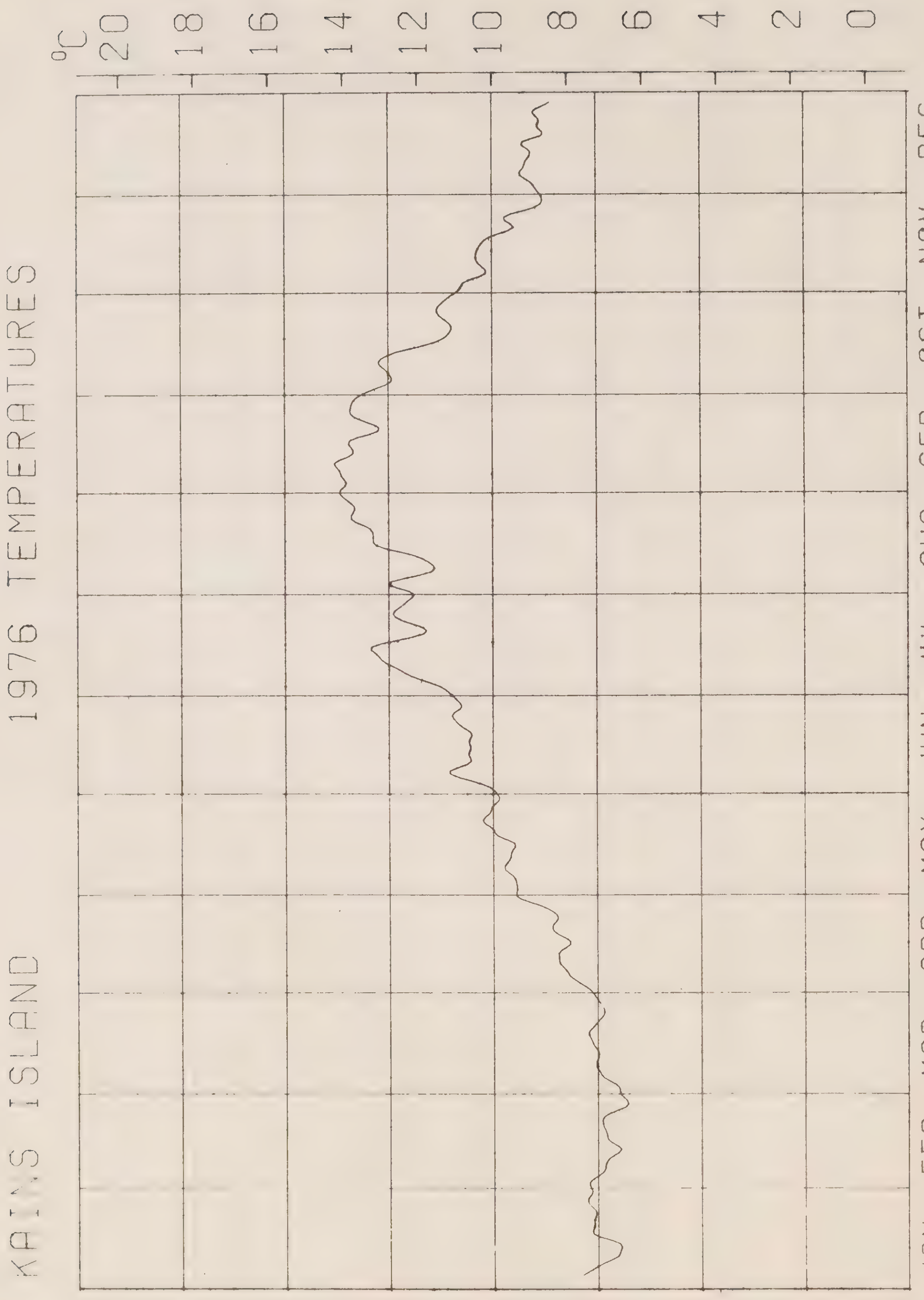
KAINS ISLAND 1976 TEMPERATURES
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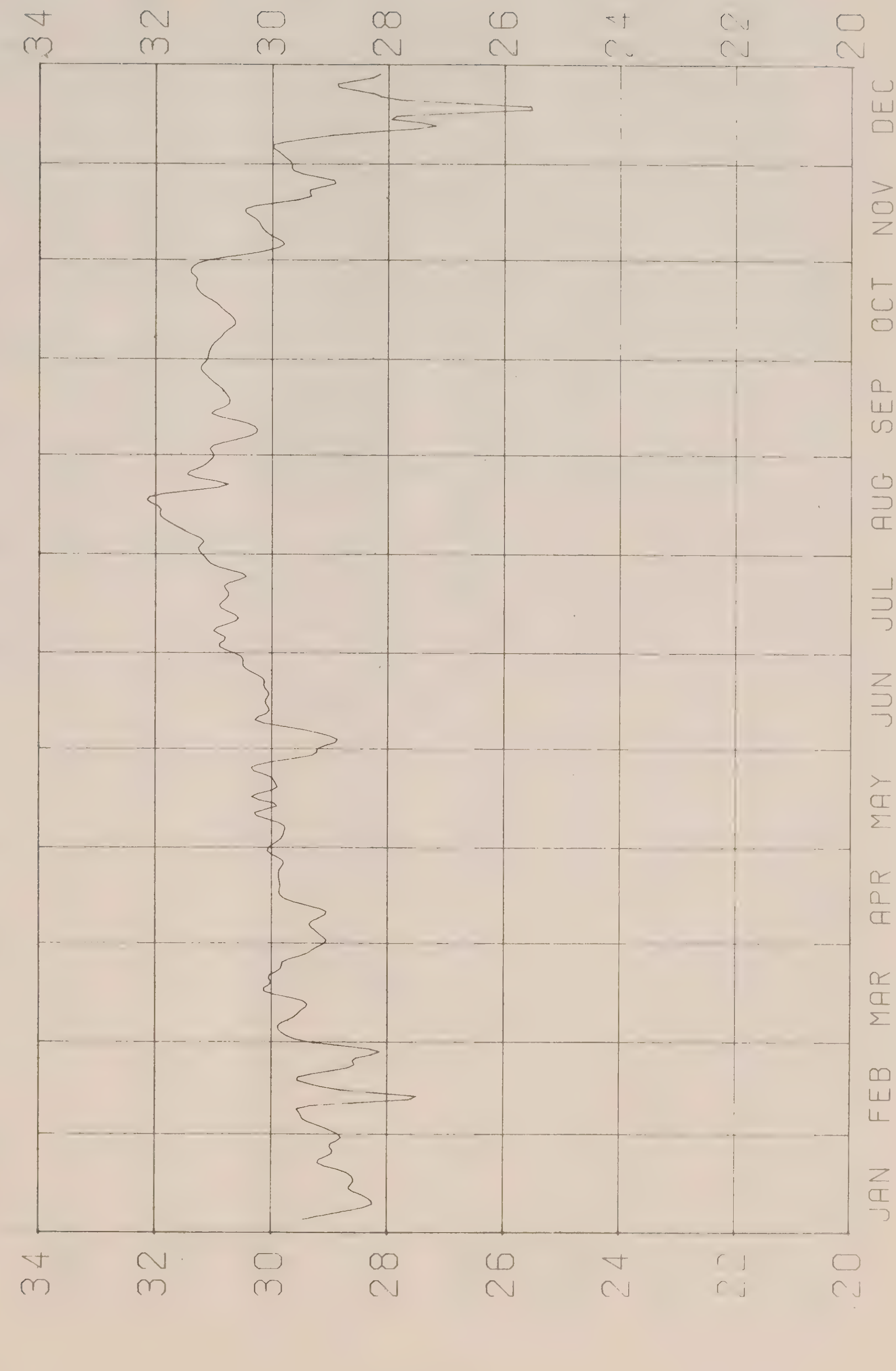
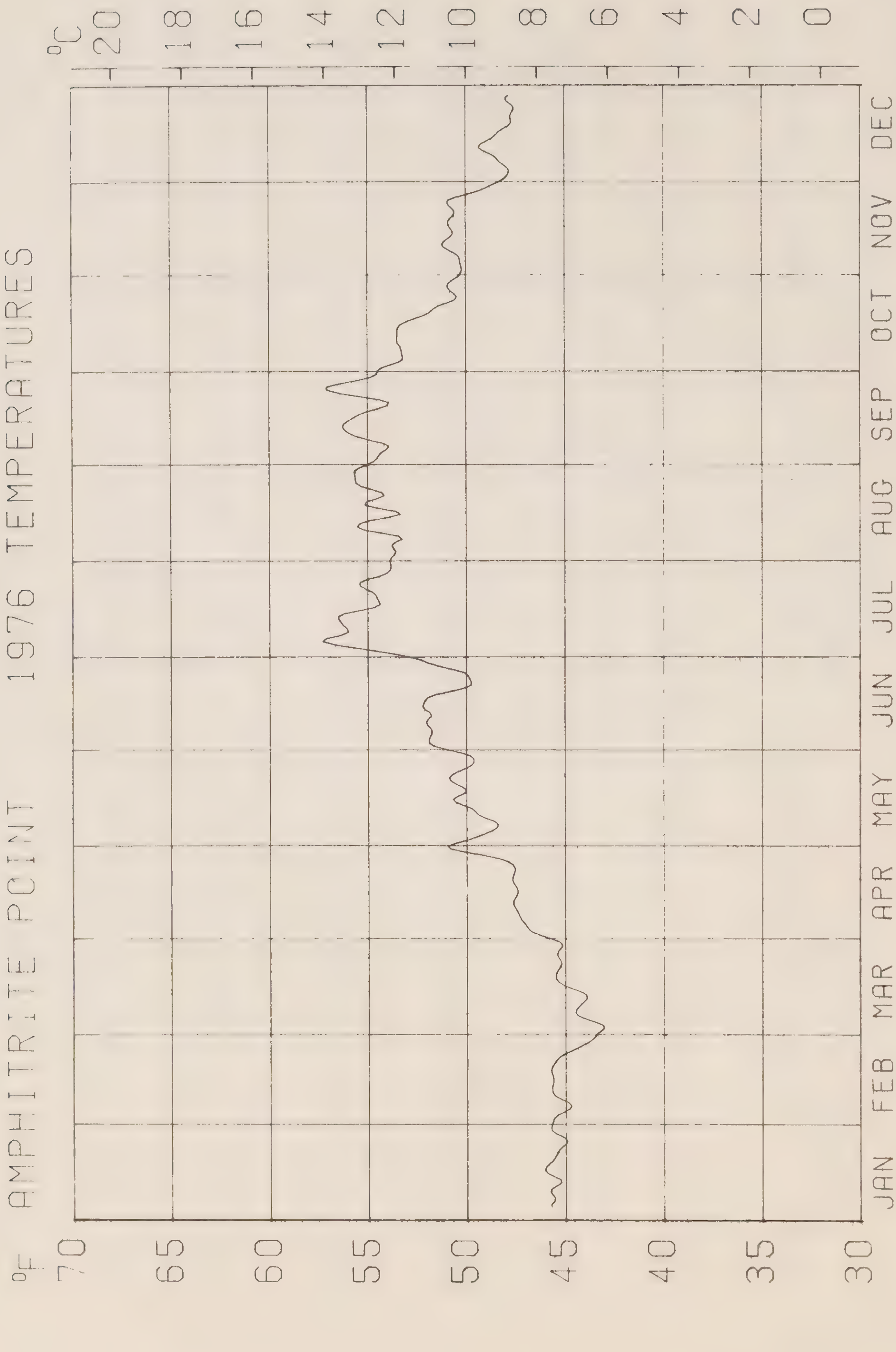
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

KAINS ISLAND 1976 SALINITIES




AMPHITRITE POINT 1976 TEMPERATURES
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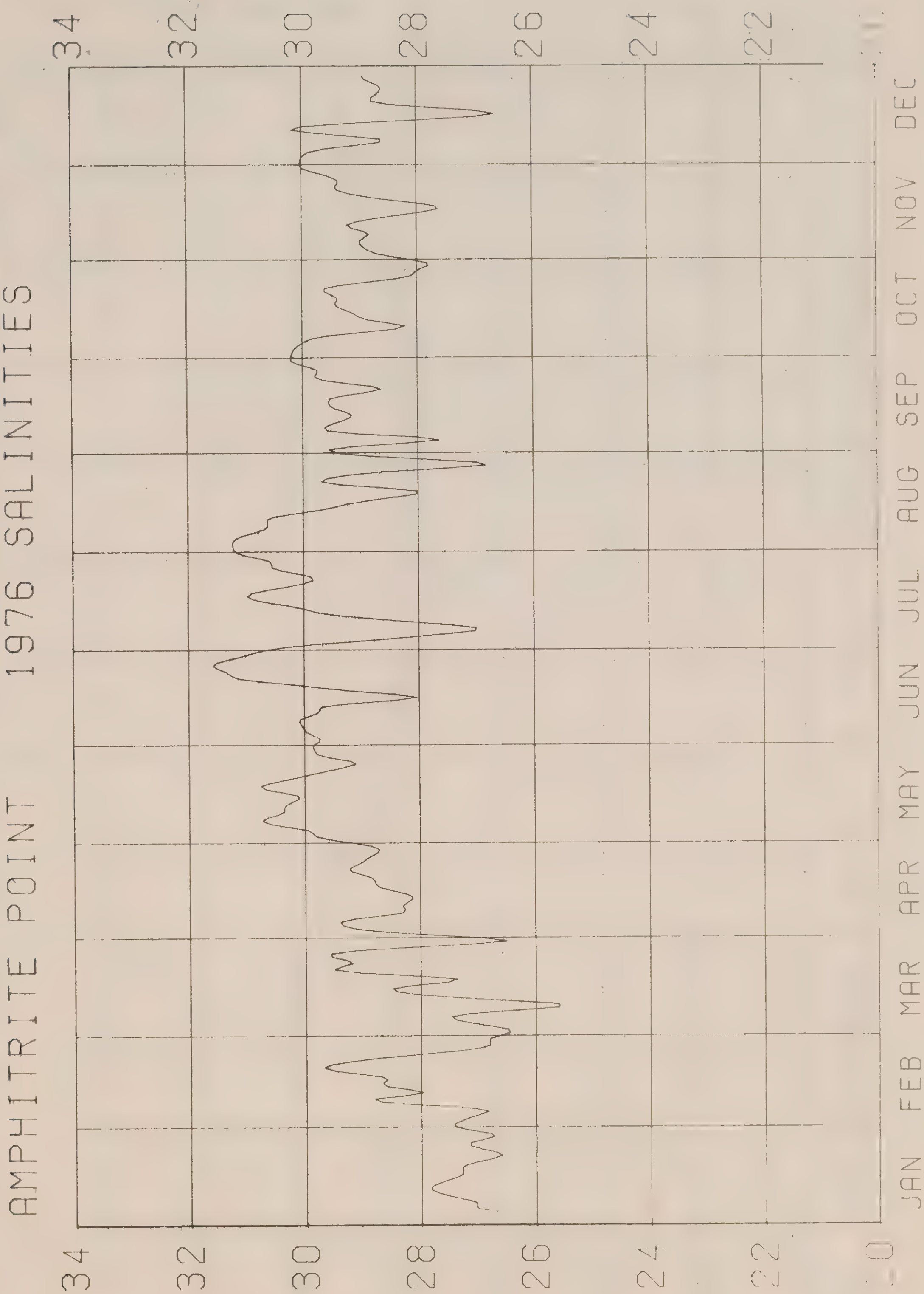
AMPHITRITE POINT 1976 SALINITIES
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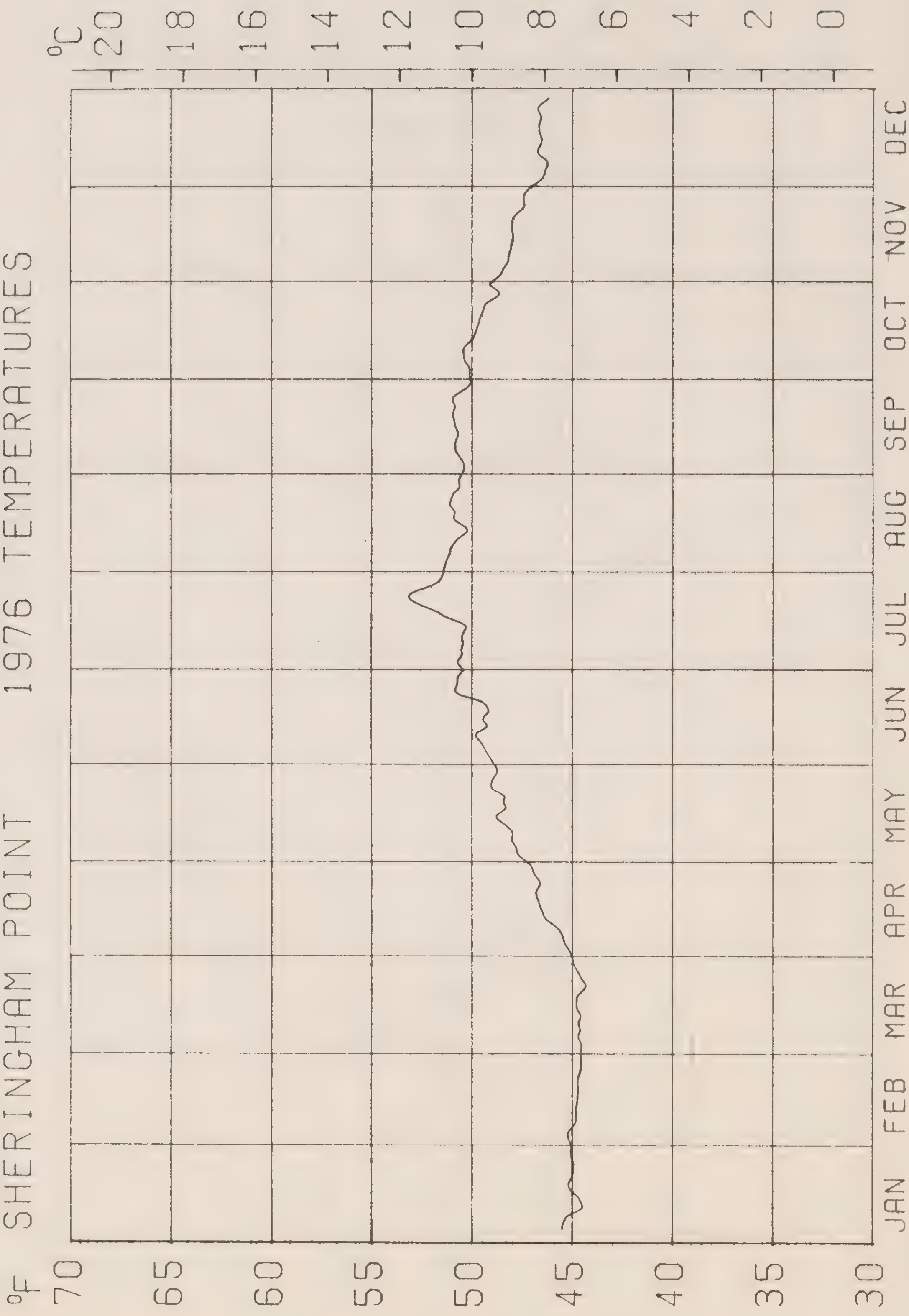
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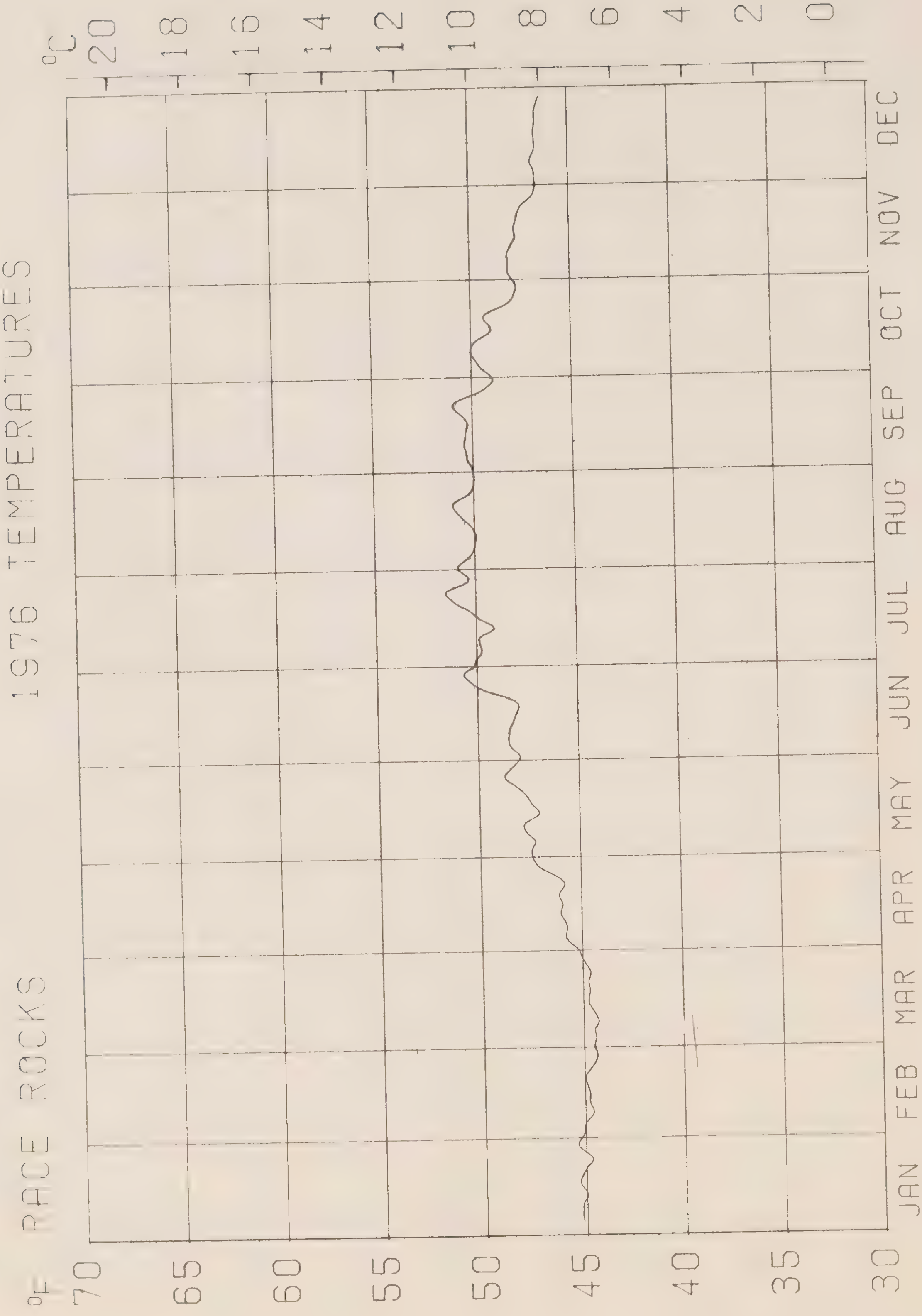
RACE ROCKS
1976 TEMPERATURES
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NOV
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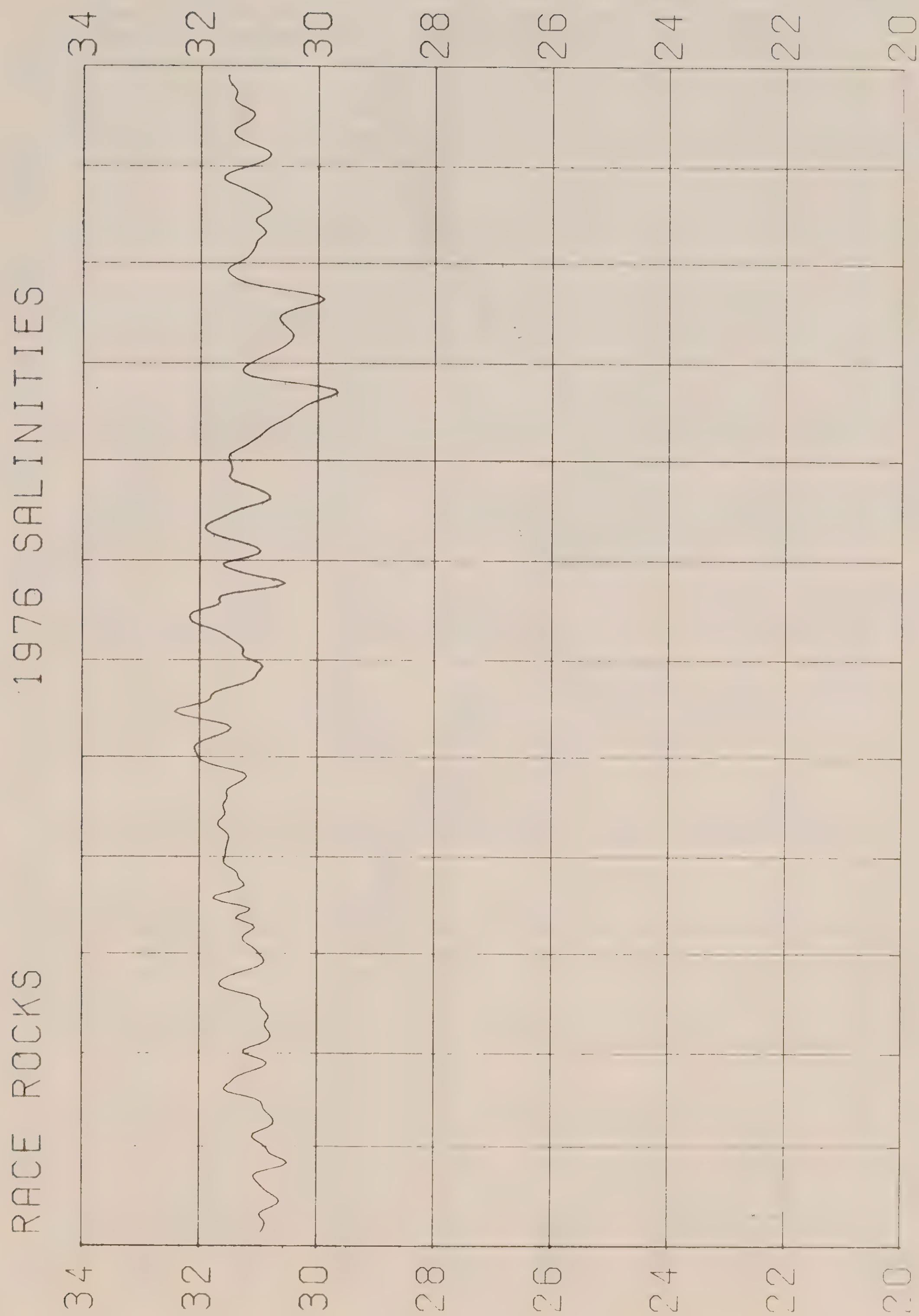
RACE ROCKS
1976 SALINITIES
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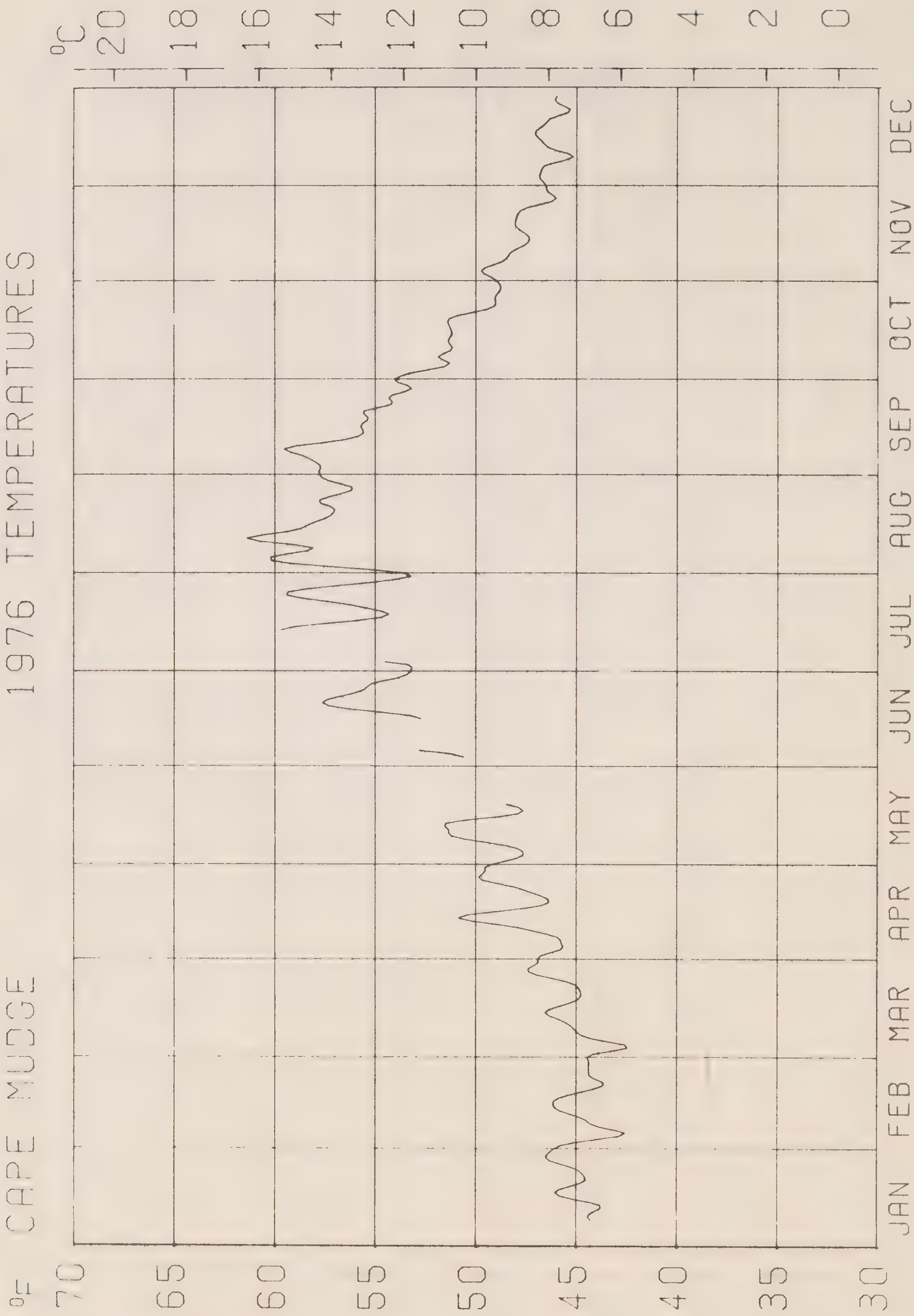
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC



CAPE MUDGE
1976 TEMPERATURES
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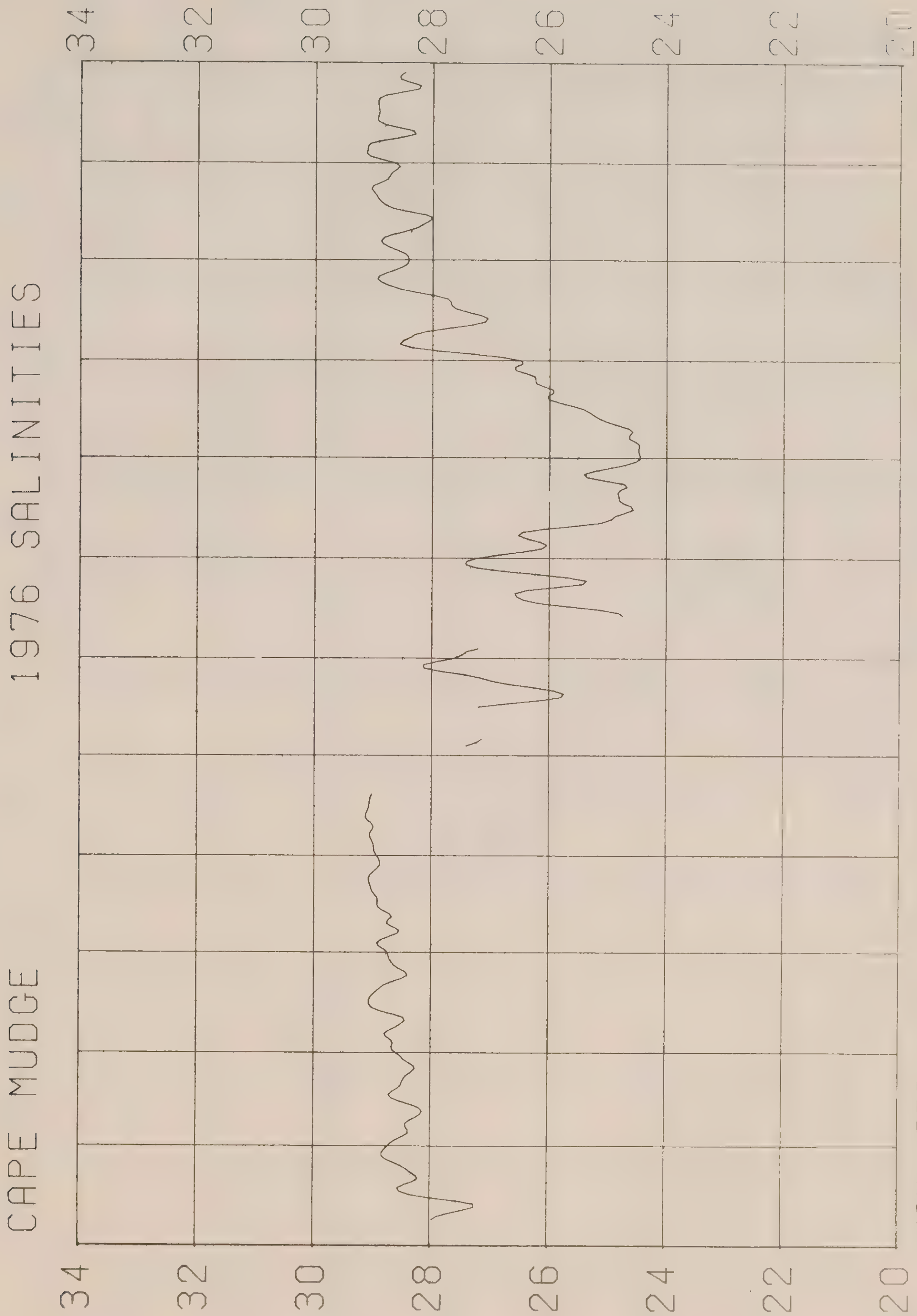
CAPE MUDGE
1976 SALINITIES
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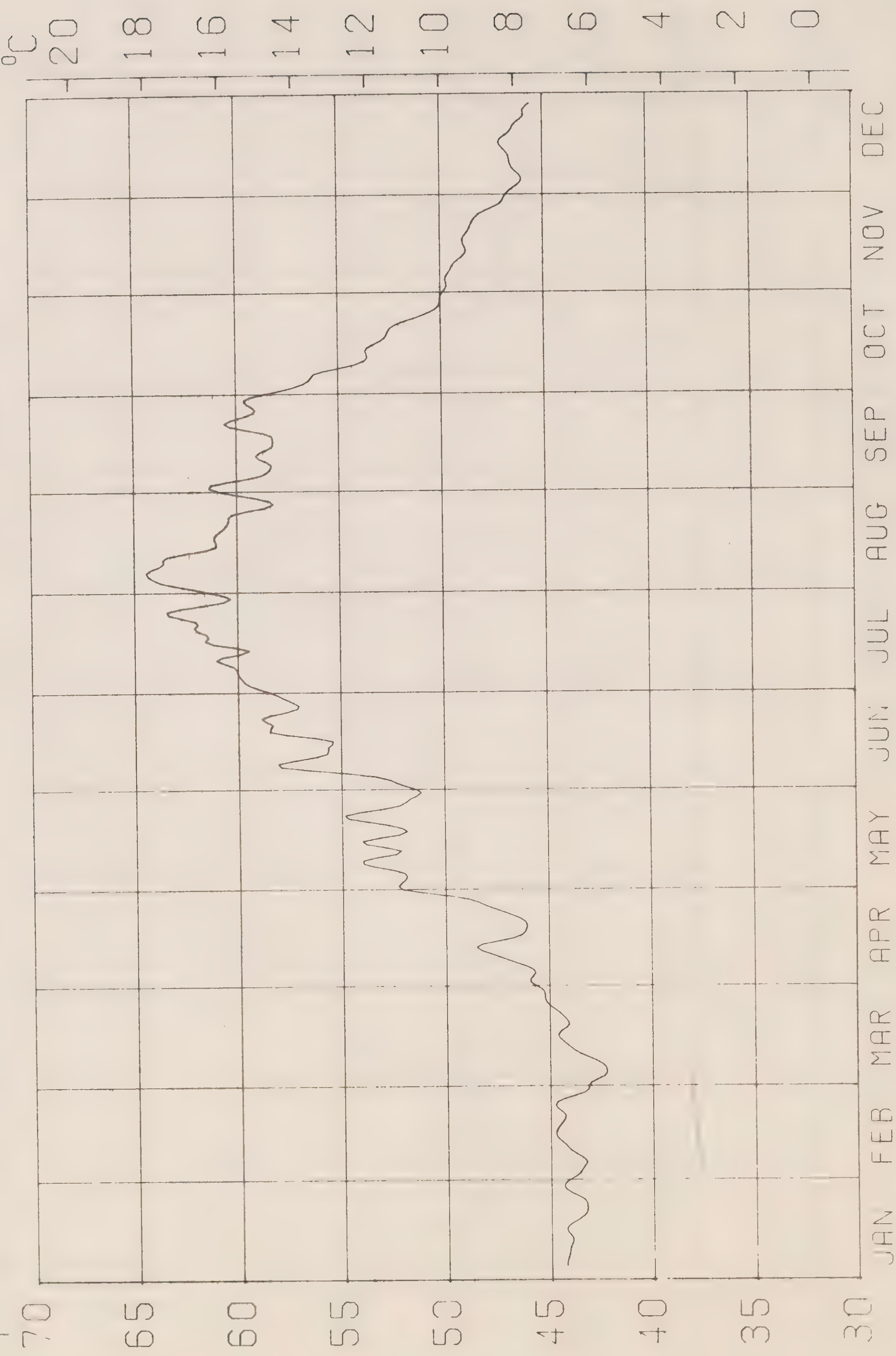
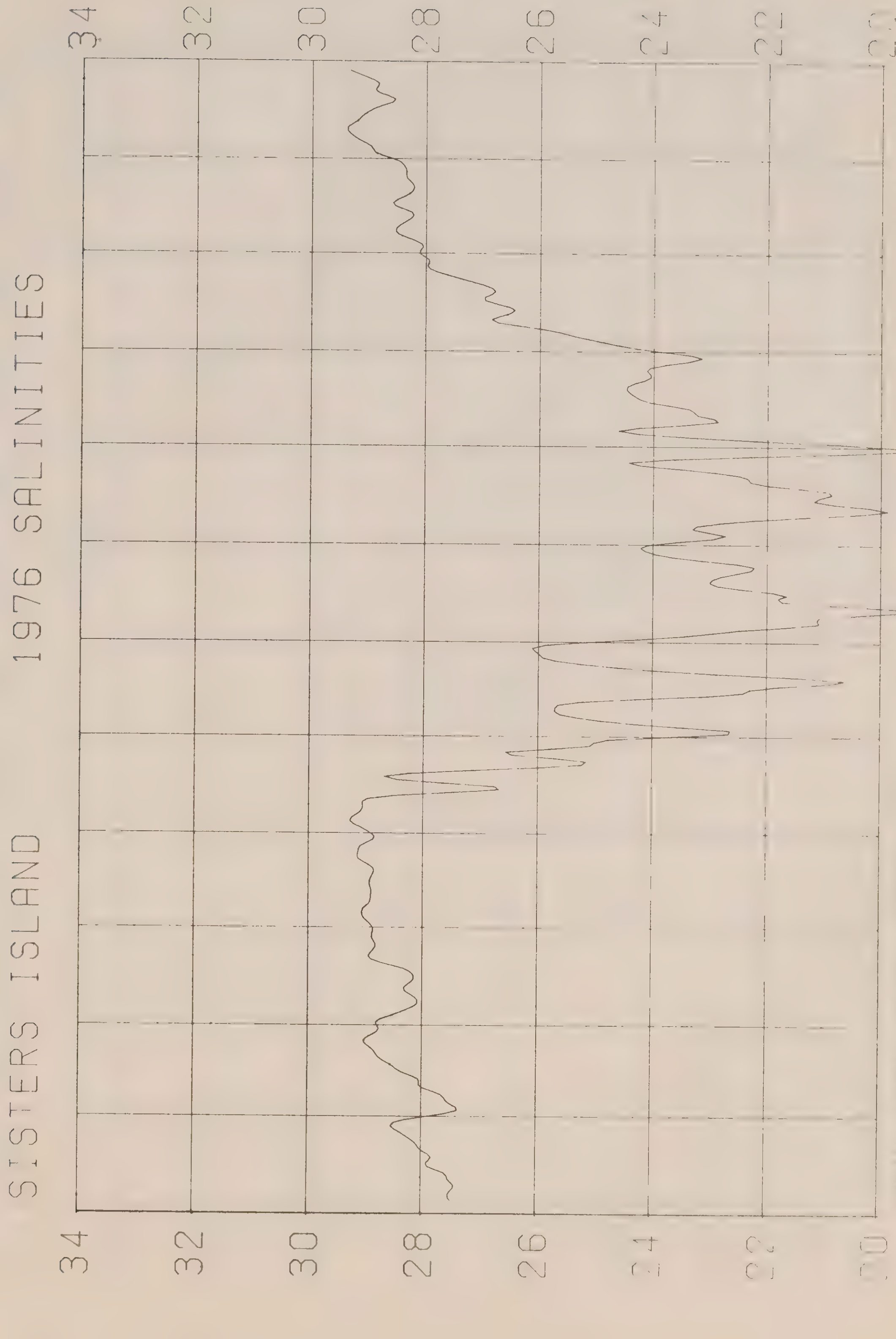
NOV
DEC

SISTERS ISLAND 1976 TEMPERATURES




SISTERS ISLAND 1976 SALINITIES
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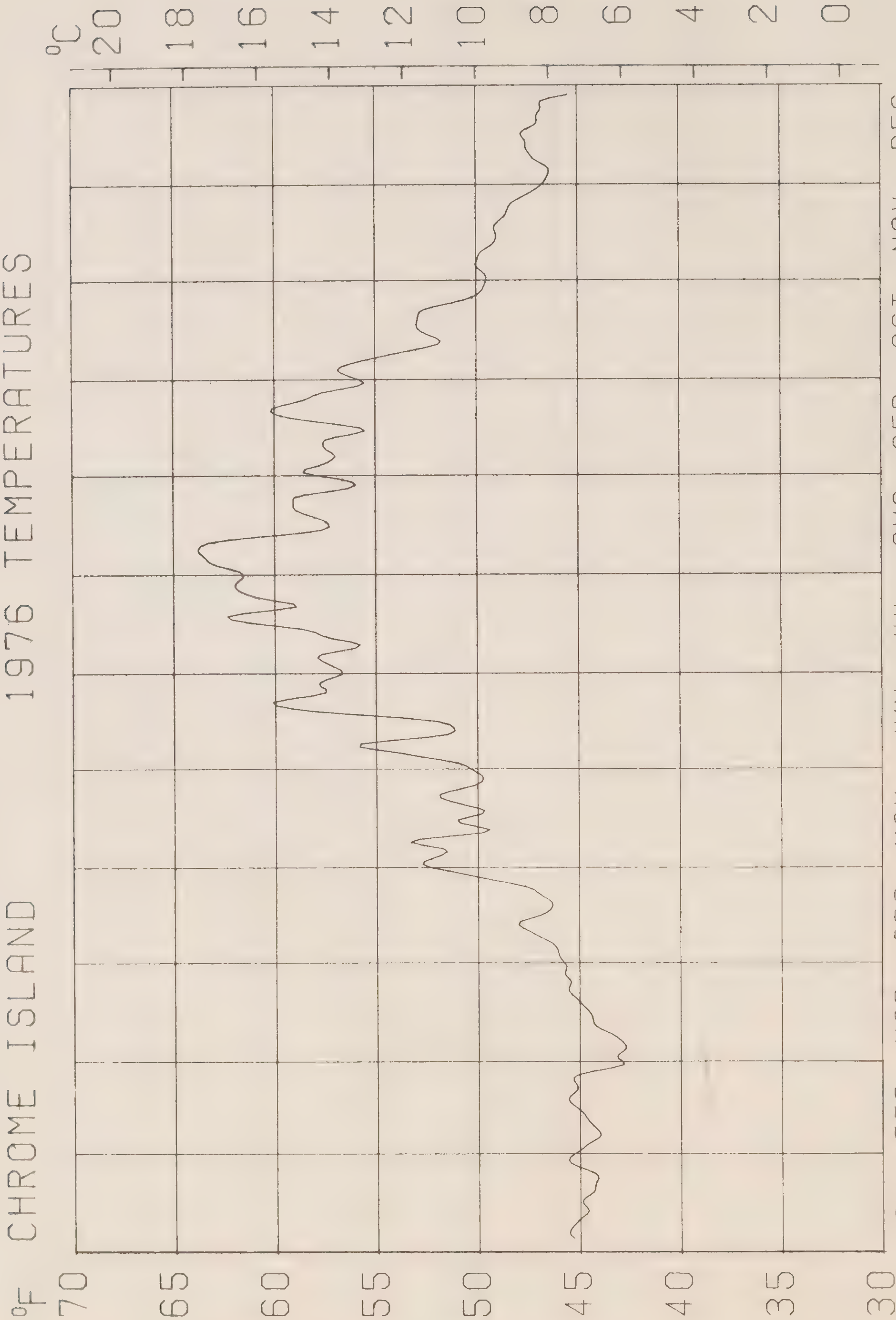
NOV
DEC


CHROME ISLAND 1976 TEMPERATURES
°F
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°C
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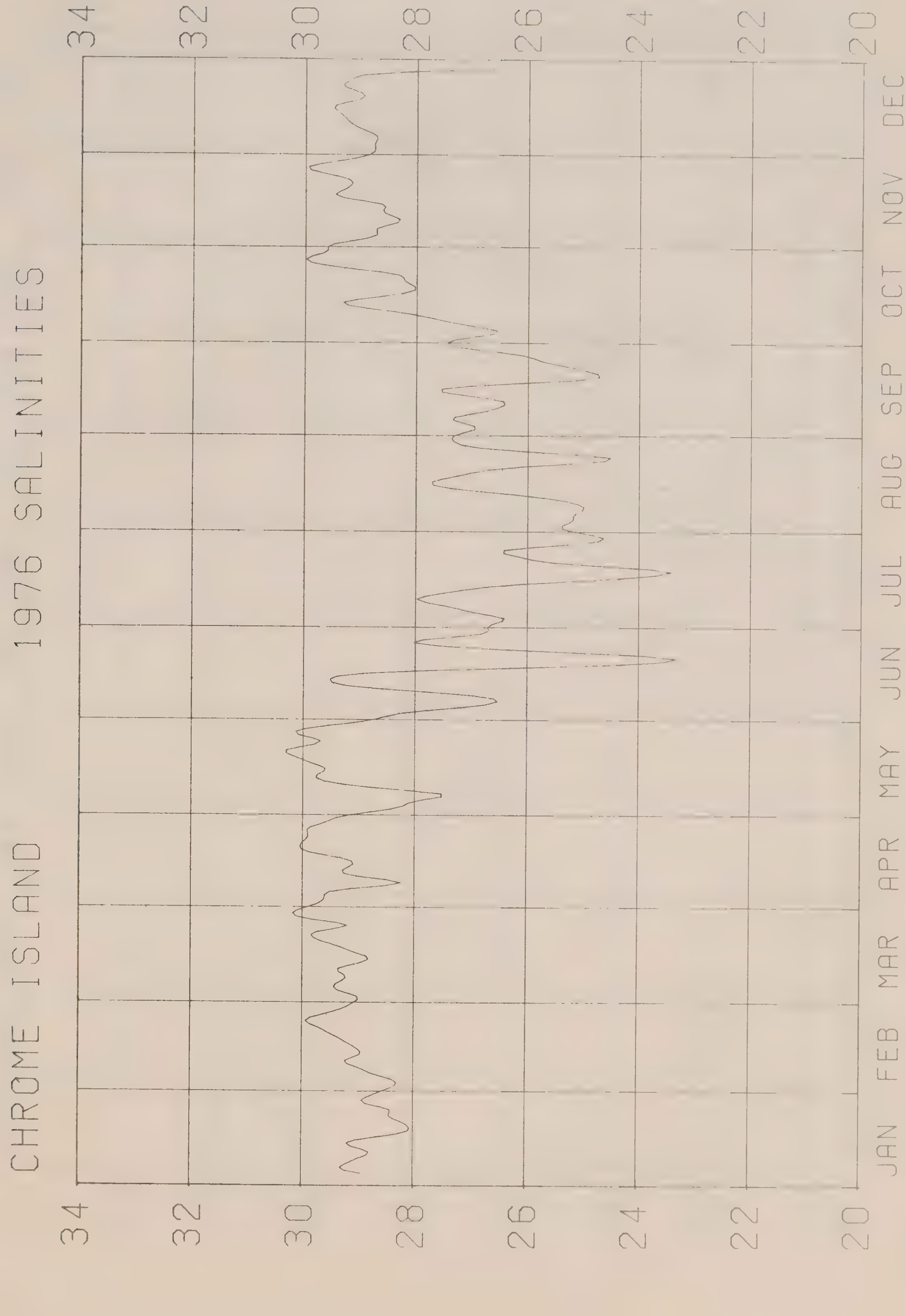
CHROME ISLAND 1976 SALINITIES
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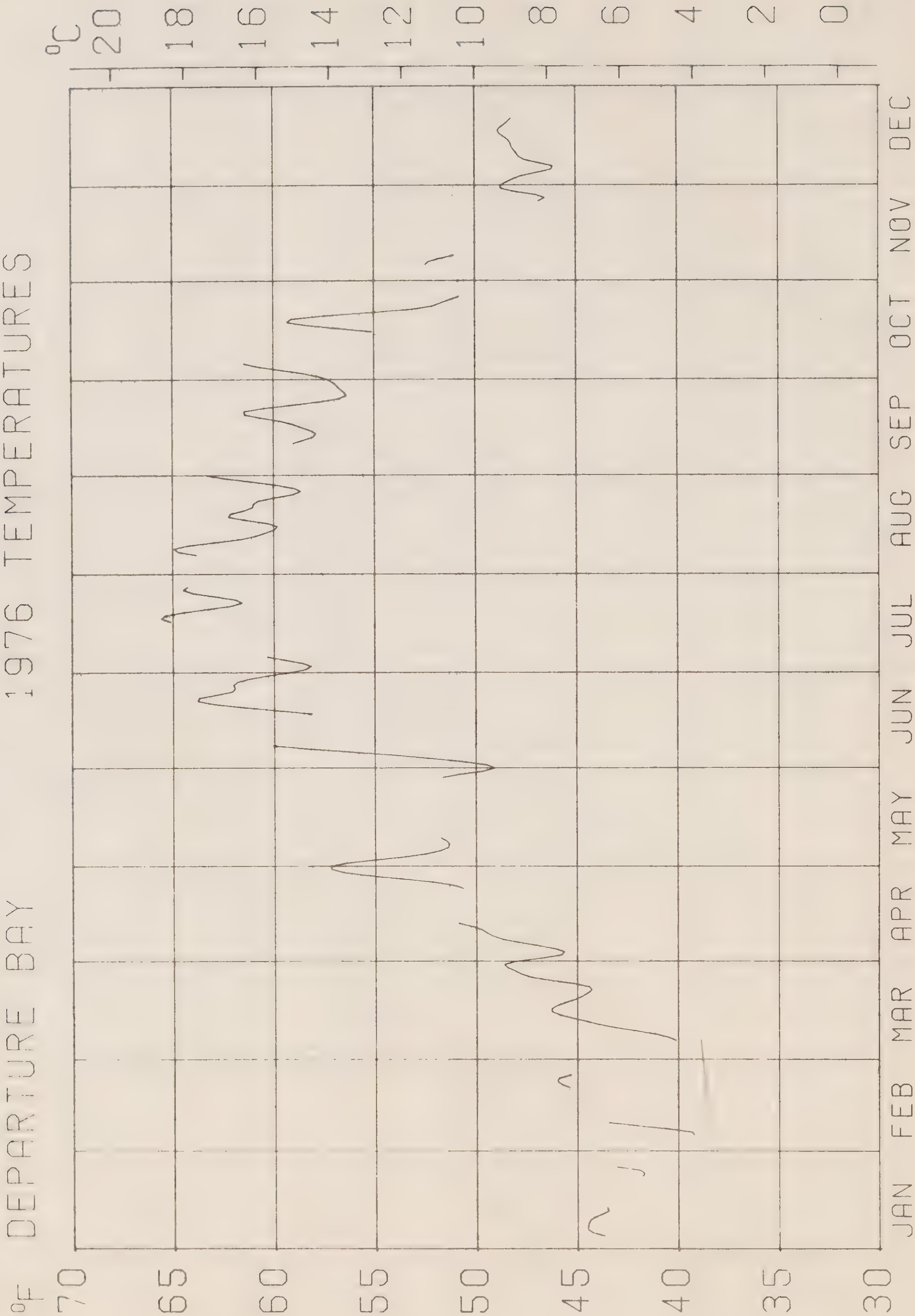
DEC


DEPARTURE BAY 1976 TEMPERATURES
°C
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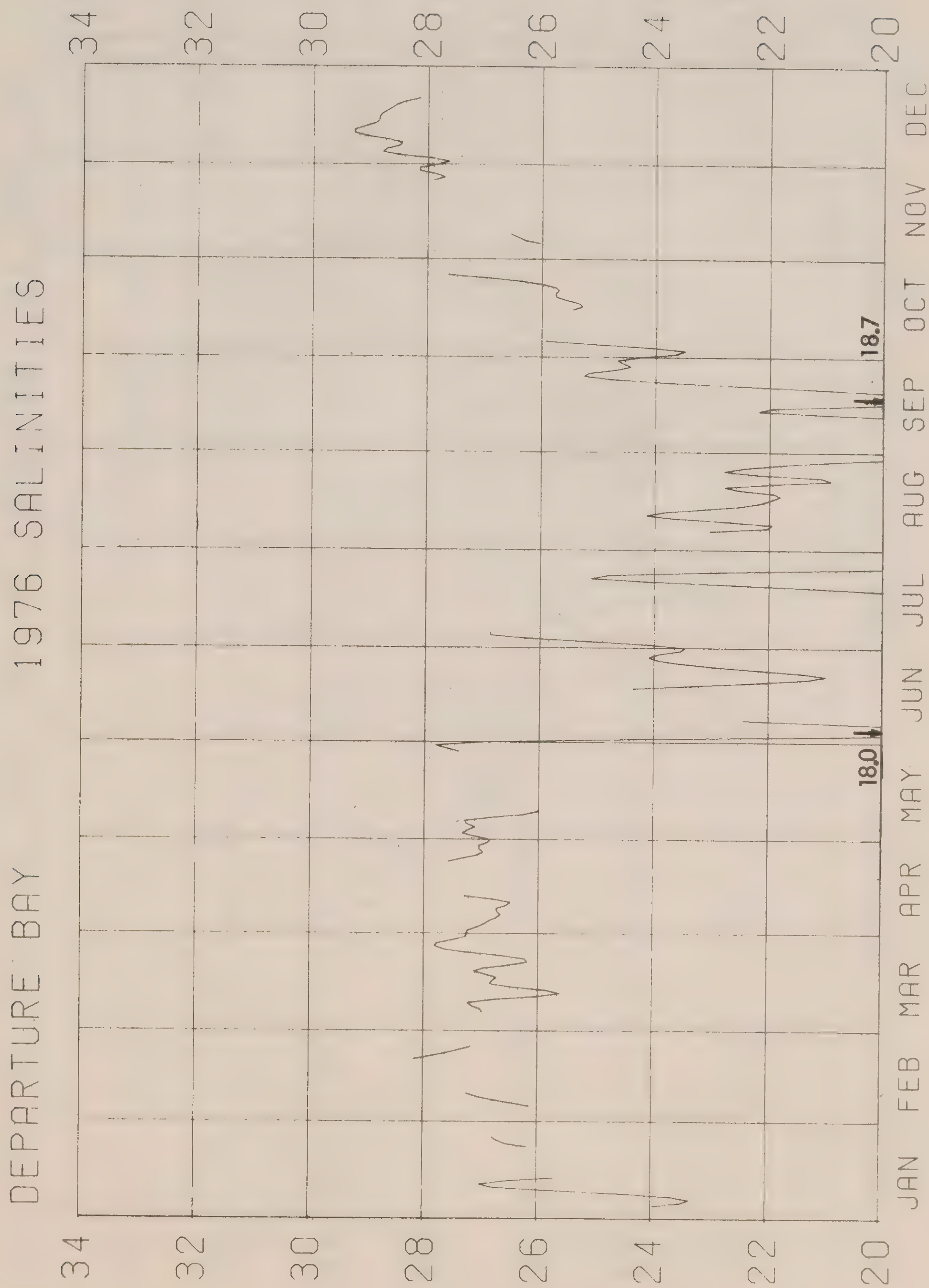
DEPARTURE BAY
1976 SALINITIES
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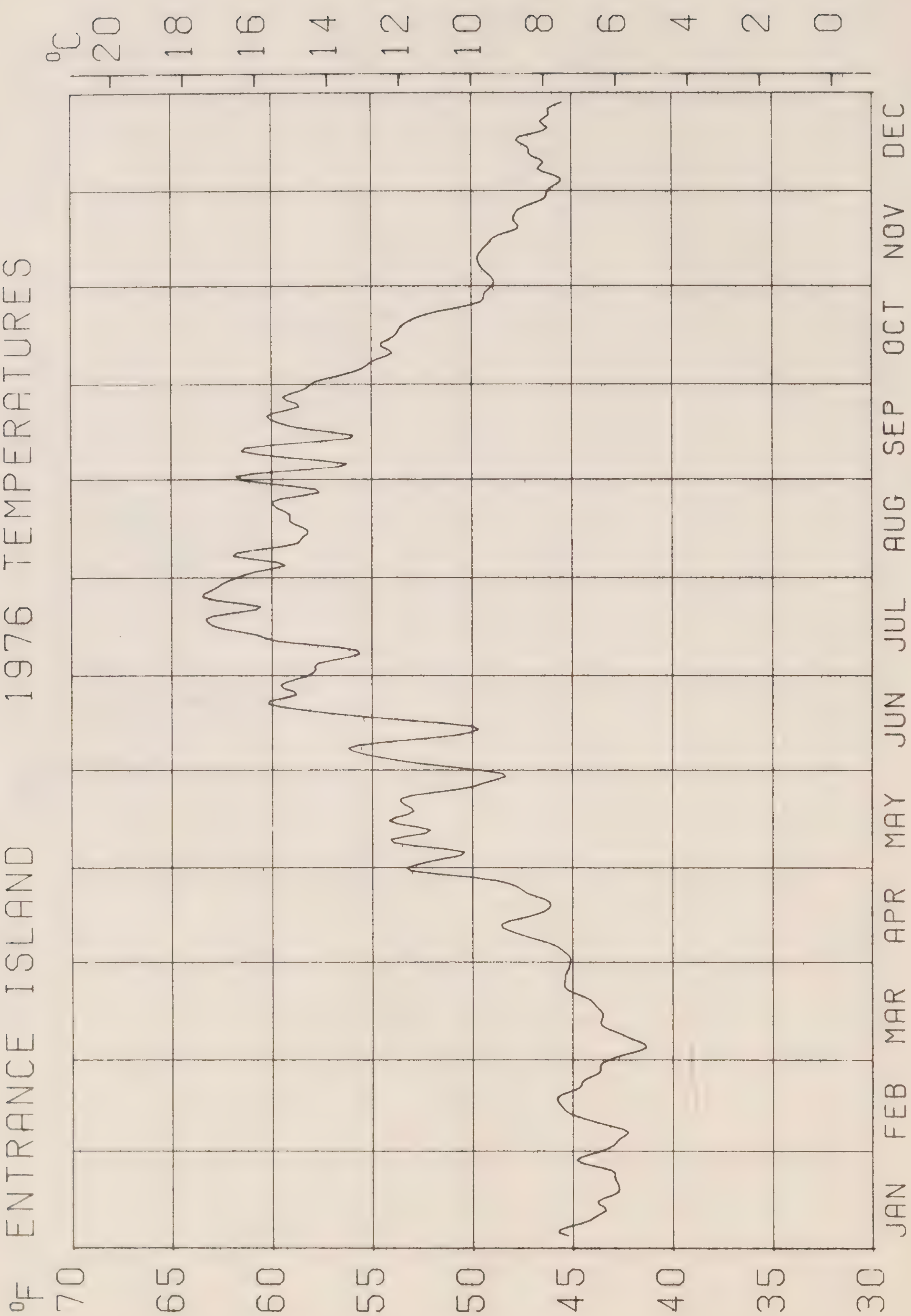
ENTRANCE ISLAND 1976 TEMPERATURES
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°C
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JAN
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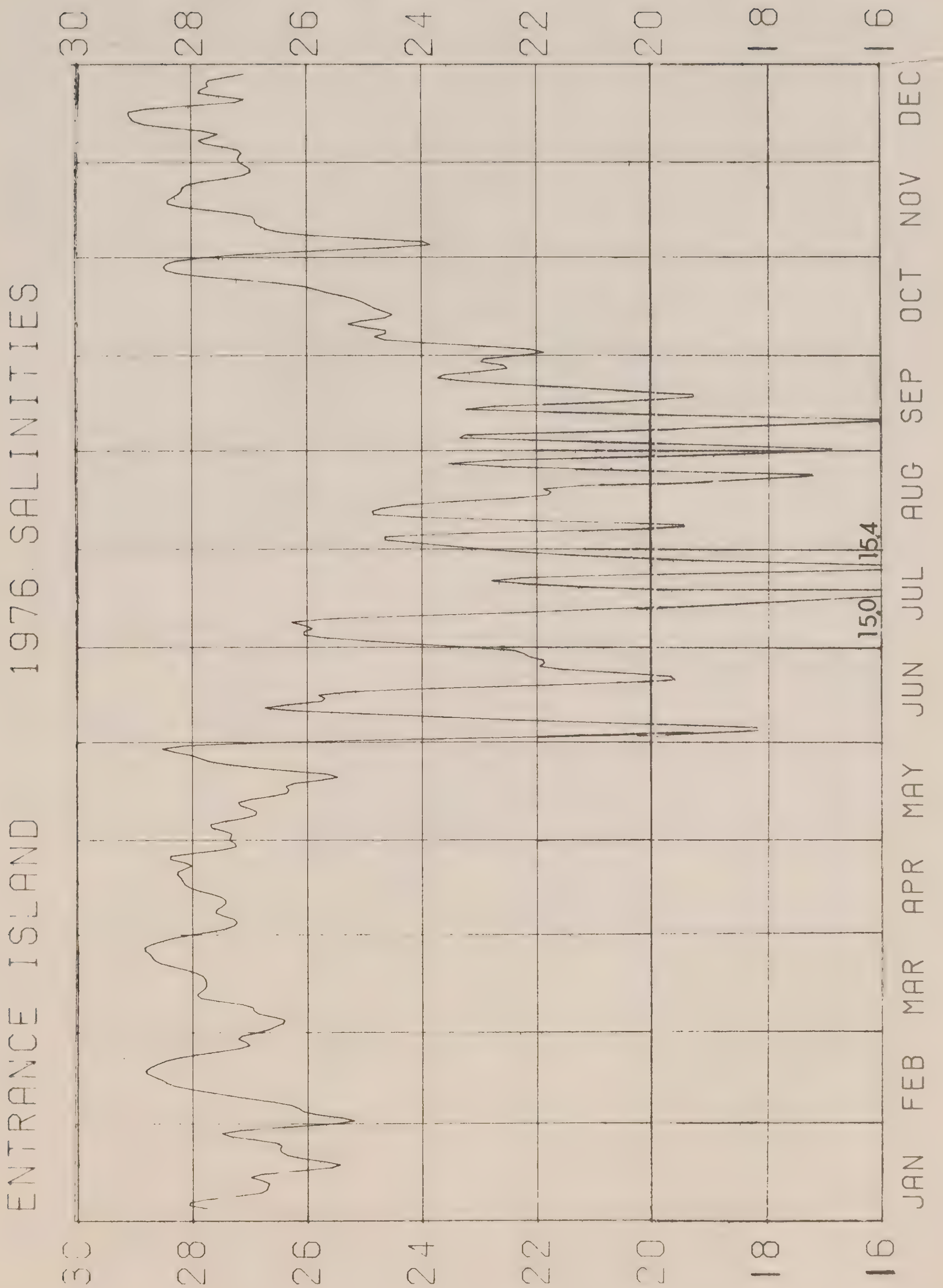
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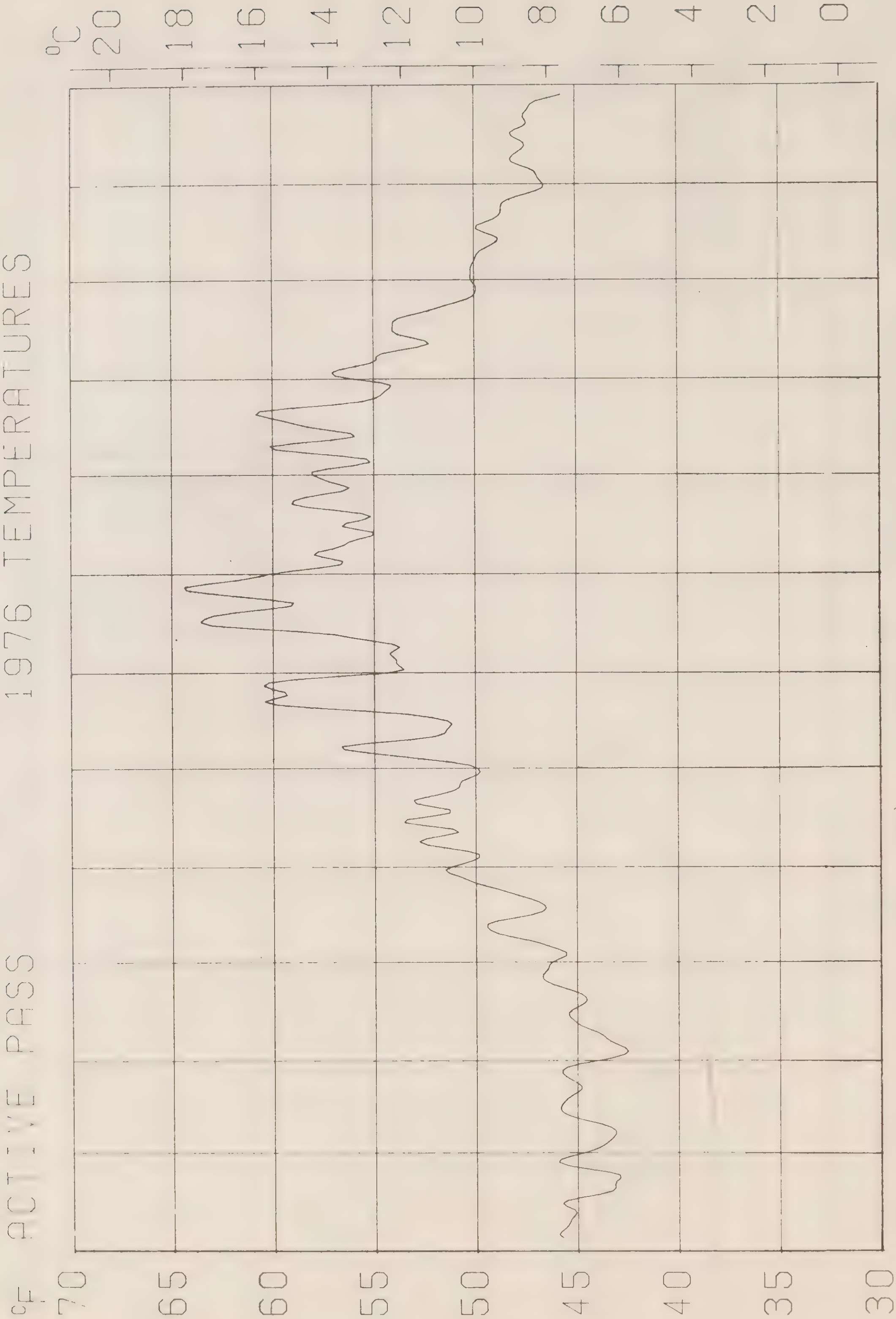
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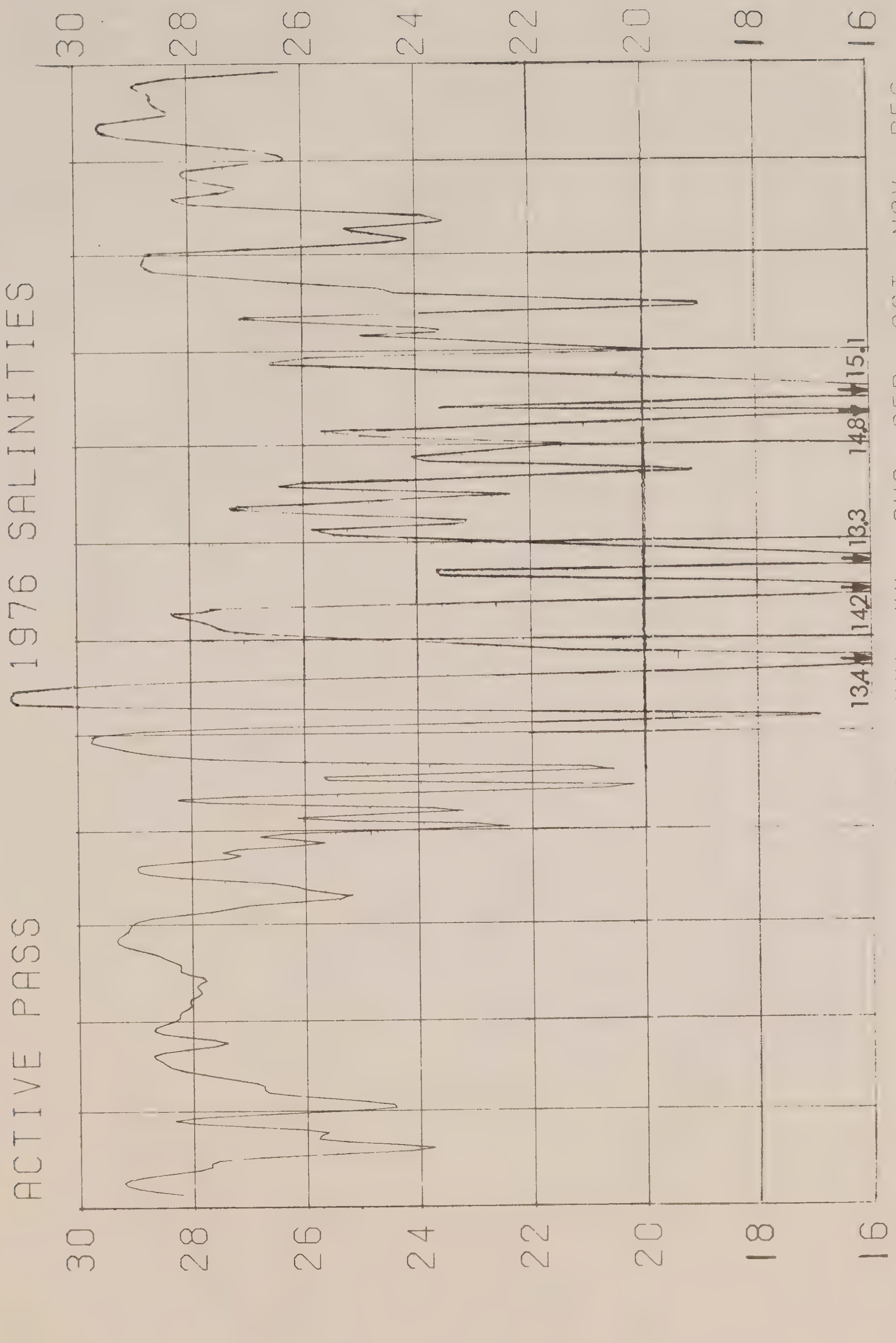

ACTIVE PASS
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Pacific Marine Science Report 78-13

A LORAN-C CALIBRATION, THE WEST CANADIAN CHAIN OFFSHORE OPERATIONS AND DATA ANALYSIS

by

A. Mortimer, D.H. Gray, R.M. Eaton

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This is a manuscript which has received only limited circulation. On citing this report in a bibliography, the title should be followed by the words "UNPUBLISHED MANUSCRIPT" which is in accordance with accepted bibliographic custom.

ABSTRACT

This report describes the data collection and analysis for the preparation of accurate Loran-C lattices. Accurate lattices for charts with scales of 1:150,000 and smaller have been produced. The data collected is tabulated in this report.

ACKNOWLEDGEMENTS

The authors wish to thank the following people and organizations for their assistance in the charting calibration of the West Canadian Loran-C Chain:

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Lt. W. deGeorge	U.S.C.G., George, Washington
Mr. R. Melby	N.O.S., Seattle
Mr. E. Schening	C.C.G., Telecom, Ottawa
Mr. B. Davies	C.C.G., Telecom, Ottawa
Mr. J. Rennie	C.C.G., Telecom, Ottawa
Mr. B. Deane	Station Manager, Williams Lake
Mr. T. Kew	C.C.G., Vancouver
Mr. J. Howard	D.O.C., Vancouver
Mr. R. Baker	C.C.R.S., Ottawa

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INTRODUCTION

The Canadian Hydrographic Service (C.H.S.) carried out a calibration of the West Canadian Loran-C Chain in the spring of 1977. The calibration was to provide information to enable the C.H.S. to produce accurate hyperbolic lattices for charts of the British Columbia coast (see Fig. 1). Overland paths from the transmitters to the service area made accurate chart latticing difficult, as the phase lags along these paths could only be estimated. Although models for predicting these phase lags exist, it was not known how well they would work on the rugged terrain and complicated conductivites existing in western Canada. Brunavs investigated the effects of non-homogeneous terrain on groundwave propagation at 100 Khz and refers to work by Millington, Begelow, Wait and, with specific reference to Loran C, by Johler and Doherty (1). Without the application of accurate corrections for varying transmission path conductivities, errors of over 1000 metres (m) could occur in the charted hyperbolae in areas critical to navigation, such as the entrance to Juan de Fuca Strait. These errors would not be completely removed by the United States Coast Guard (U.S.C.G.) chain calibration, which is, in effect, an averaging process. Thus, even after U.S.C.G. calibration, systematic charting errors of up to 500 m were expected. Now, as a Loran-C hyperbolic position line has a repeatability of about ±85 m, the potential accuracy of the system would be much enhanced by calibrating out systematic errors due to varying conductivities when drawing chart lattices.

CALIBRATION

The principal objective of the offshore calibration was to measure the times of arrival (T.O.A.'s)of Loran-C transmission from Williams Lake (Master), Shoal Cove (X-secondary) and George (Y-secondary) off the B.C. coast and thereby define chain parameters for lattice production. The use of hyperbolic readings would, of course, not allow an appreciation of the conductivity effects along the individual transmission paths. To measure the travel time of a Loran-C pulse from the transmitters at Williams Lake and George, Washington, to the coast, Loran-C monitor receivers were synchronized close to (30 kms) the transmitters where the inaccuracies in predicted T.O.A.'s would be negligible. The receivers were transported to Victoria, synchronization being maintained throughout the operation. This procedure, which is described in reference number two, provided the starting T.O.A.'s for the calibration. Thus it was possible to use measured travel times and not rely on an unconfirmed prediction for any part of the calibration. The synchronization of the Shoal Cove, Alaska, transmitter was made at Masset, B.C. where there is a minimum of conductivity variation along the transmission path.

Table 1

Travel Times to Victoria (in microseconds)
Patricia Bay, Δ Bole
Lat. 48-39-15.336N Long. 123-27-00.855

	Master	X-Secondary*	Y-Secondary
Adjusted T.O.A.	13569.30		42337.35
Clock Synch.	-12309.90	-12308.94	-12308.43
Emmission Delay		-13343.58	-28927.37
Travel Time	1259.40		1101.55

* No reliable signals were received at Patricia Bay.

EQUIPMENT

The following navigational equipment was placed in C.S.S. Parizeau (see Fig. 2).

1 Loran-C Monitor System
(On loan from the U.S.C.G.)

c/w 1 Austron 5000 Loran-C Monitor Receiver
1 PDP 8e Computer
1 A.S.R. Data Terminal
1 Passive Notch Filter Array
1 Whip Antenna
1 Uninterruptable Power Supply Unit
1 Line Conditioner
1 HP 5062C Cesium Frequency Standard

1 Loran-C Navigation System
(On loan from the Navigation Group, Bedford Institute, Dartmouth, N.S.)
c/w 1 Austron 5000 Loran-C Navigation Receiver
2 PDP 8e Computers
1 A.S.R. 33 Teletype
1 Uninterruptable Power Supply Unit
1 HP 5061A Cesium Frequency Standard
1 HP 5060A Phase Comparator

1 Satellite Navigation System
(On loan from C.H.S., Central Region)
c/w 1 Magnavox 702A Receiver
1 HP 2100 series computer
1 Interface to Loran-C Navigation System
1 Interface to S.A.L. log and Sperry Gyro Compass

Equipment (Cont'd)

1 Satellite Navigation System
c/w 1 Magnavox 702 CA Receiver
1 HP 2114 Computer
1 HST Tape Reader and Punch
1 Interface to S.A.L. log and Sperry Gyro Compass

Other Receivers, etc.

1 Internav LC 204 Loran-C Receiver
1 Decca DL 91 Loran-C Receiver
1 North Star 6000 Loran-C Receiver
1 Micro Logic ML 200 Loran-C Receiver
1 HP 9825 Calculator

OPERATIONS

The navigation equipment was installed in C.S.S. Parizeau (Capt. E. Fisher) between day 073 and day 077, 1977. To test the effect, on the T.O.A. readings, of the ship's attitude to the wave front of the Loran-C transmission the ship was turned about the head of the wharf at Patricia Bay. The responses of the T.O.A.'s were within the usually accepted tolerances for Loran-C for both changes in position and in heading. During an overnight shake-down cruise the effects of the C.K.N. (110.75 Khz) communication transmission were investigated.

Parizeau sailed from Esquimalt on day 081 for the West Coast of Vancouver Island. The ship's log was calibrated over the measured mile off Esquimalt. The route taken by the ship included lines 15 kilometres (km) and 45 km off Vancouver Island and the Queen Charlotte Islands, to collect data that would show the change in phase lag as the transmission travels away from the land. Two lines, radial to Williams Lake were run, one north of Cape Scott into the mainland shore and one south of Cape Scott. These lines were designed to demonstrate the effect of phase lag changes imparted by the transmission's passage across Vancouver Island, and allow comparison with an all seawater path from the mainland coast out to the 200 mile limit. Data was collected in Hecate Strait and Dixon Entrance to ensure the accurate charting of these important fishery areas. Twenty-four hours were spent in Masset (day 088) to synchronize the receivers with the Shoal Cove transmission and to check the clock rates (see Reference #2 for data). Two visits were made to Winter Harbour (days 083 and 093) to check clock rates over a long period and to allow the establishment of a check co-ordinate in case synchronization was lost off the northern B.C. Coast. Parizeau returned to Patricia Bay on day 096, having collected nearly 400 satellite calibration positions.

DATA ANALYSIS

Doppler Satellite Fixes

The basis of comparison for the calibration was provided by selected

Satellite Navigation System positions. It was expected that these positions would have an accuracy of better than ±150 m, which would be satisfactory for coastal charting at scales of 1:150,000. The Magnavox 702A receiver was used as the principal system for basic position determination. The U.S.C.G. Loran-C monitor system was used to make the principal T.O.A. measurements. The satellite system doppler measurements were corrected for ship's velocity, input to the system either from ship's log and gyro compass or from Loran-C range co-ordinates. Initially, the course and speed was directly entered from the BIO Austron 5000 receiver but this course and speed appeared too erratic. After leaving Masset (day 089) the Sal log and gyro compass were used for course and speed. They were corrected after every half hour to agree with the course and speed from the BIO system. After day 084 satellite passes were recomputed using a constant course and speed as determined by the BIO system. Recomputation was not always possible due to another satellite pass starting, or a large change in course or speed during the pass.

The satellite fixes were analyzed using the geometry and configuration of the pass (max. altitude, doppler counts, symmetry, etc.) and the numerical considerations of the solutions (iterations, standard deviations, etc.) into simple evaluation in latitude and longitude (excellent, good, fair, poor, bad).

Datum Shift

The Magnavox system computes co-ordinates on the surface of an ellipsoid whose centre is at the centre of gravity of the earth. The antenna is assumed to be at known height above, or below this ellipsoid. The co-ordinates used for surveys in Canada are on the 1927 North American Datum which uses another ellipsoid (Clarke 1866) which is not centred at the centre of gravity. The parameters of the two ellipsoids are given in Table 2.

Table 2

Ellipsoidal Parameters

	Semi-Major axis	Flattening
Satellite	6378144.0 m	1/293.465
Clarke 1866	6378206.4 m	1/294.9787

The three mutually orthogonal co-ordinate differences at the centre of ellipsoids were determined by best fitting the mean satellite fixes at Patricia Bay, Fuelling Jetty (Esquimalt), Graving Dock (Esquimalt), Winter Harbour and Masset with the corresponding position determined by conventional ground surveys on the 1927 North American Datum.

Table 3

Datum Shift

X (1927 NAD) = X (SATNAV) + 23 metres

Y (1927 NAD) = Y (SATNAV) - 165 metres

Z (1927 NAD) = Z (SATNAV) - 197 metres.

The positions of the transmitters and calibration points were known on the 1927 North American Datum. The resulting 1927 North American Datum co-ordinates are given in Appendix A.

Clock Rates

The frequency standards used in the calibration are compared with the standard in use at the Master transmitter at Williams Lake. Short term (less than 48 hrs) clock rates were determined by the U.S.C.G. modified Austron 5000 receiver, and the BIO Austron 5000 receiver at various points. During the same time the Comox monitor was also logging T.O.A. readings, so the clock rate of the Comox monitor is also available.

Table 4

Clock Rates

(Parizeau Operations)

Clock Rate at:	Day	Hours	U.S.C.G.	BIO	Comox
				Units = microsec./day	
Williams Lake				.2108	
Patricia Bay	77	6	.673 ± .0593		.086 ± .021
Patricia Bay	80	8	.126 ± .0210	.080 ± .0402	-.061 ± .018
Debunkering	80	4	-.523 ± .1021	-.587 ± .0684	-1.039 ± .120
Fuelling Jetty	80	5	.641 ± .0546	.513 ± .0865	.385 ± .053
Graving Dock	81	13	.368 ± .0097	.469 ± .0333	-.110 ± .016
Winter Harbour	83	17	.233 ± .0066	.140 ± .0114	-.000 ± .000
Masset	88	24	.153 ± .0089	.044 ± .0154	-.053 ± .004
Winter Harbour	93	20	.304 ± .0040	.195 ± .0077	.009 ± .005
Patricia Bay	96	20	.258 ± .0038	.193 ± .0059	-.108 ± .007

Long term clock rates at Comox monitor show a much more uniform slope. These rates are given in Table 5.

Table 5

Clock Rates (microsec./day)

(Monitor at Comox)

Day	Master	Shoal Cove	George
80.0 - 81.7	.1231 ± .0134	.1083 ± .0186	.1213 ± .0185
81.9 - 82.7	-.2142 ± .0278	-.2453 ± .0451	-.3555 ± .0264
83.0 - 97.7	-.0418 ± .0006	-.0428 ± .0008	-.0427 ± .0007
98.1 - 98.7	-.0857 ± .0191	N/A	-.0549 ± .0240
98.9 -102.8	-.0517 ± .0030	-.0544 ± .0054	-.0530 ± .0030
102.8 -105.0	-.0642 ± .0035	-.0694 ± .0115	-0571 ± .0051

The ship returning to the same spot at Winter Harbour and at Patricia Bay gives long-term clock rates by proportioning the change in T.O.A. over the elapsed time.

Table 6

Long Term Clock Rates

(Parizeau Operations)

	USCG	BIO
	microseconds/day	
Pat Bay-Winter Harbour-Pat Bay	.2748	.1985
Winter Harbour-Masset-Winter Harbour	.2723	.2039
Pat Bay-Masset-Pat Bay	.2733	.2018

On day 082 at 0200 Z the U.S.C.G. system suffered power loss. Synchronization of data before and after the interruption was achieved by comparing instantaneous values between the U.S.C.G. and BIO systems for 1 hour on either side of the failure. The low clock rate difference between the two systems is less than 0.01 microseconds over that time span. U.S.C.G. values before the interruption have to be reduced by 12860.06 microseconds to be consistent with values after the interruption. Therefore, the clock synchronization correction and clock rates necessary to reduce the observed T.O.A.'s to an adjusted value that is compatible with a constant value at the Patricia Bay wharf of T.O.A. Master = 13569.558 are given in Table 7.

Table 7

Clock Synchronization

Day	Clock Correction (microseconds)	Clock Rate Correction (microseconds/day)
80 - 92.08	-12860.060	-.2733 (Day - 82)
82.08 - 97	0.00	-.2733 (Day - 82)

The two clocks were inter-compared daily as a check on the stability of the clock rates. The results are given in Table 8.

Table 8

Clock Rates

5061A - 5062C Comparison

Master	.0674 ± .0011	microsec/day
Shoal Cove	.0629 ± .0014	microsec/day
George	.0840 ± .0041	microsec/day

Part of the modifications U.S.C.G. made to their Austron 5000 receiver was to remove a gain dependent error. This modification was not done on the BIO system. At some later date, the data will be analyzed for a correlation of gain to clock rate difference. At the moment, the gain error from a strong signal (GAIN = 50) to a weak signal (GAIN = 125) appears to be less than 0.1 microseconds.

Monitor Corrections

The duty of a monitor is to control the hyperbolic readings of the chain so that there is the long term repeatability of a set of time difference (T.D.) readings at any location. During our survey the Comox monitor was maintaining the chain at a set of T.D. values. The monitor site was moved to Alert Bay near Port Hardy and during that time the Juneau monitor controlled the X pattern and the North Bend monitor controlled the Y pattern. There were several shifts in the patterns prior to the commissioning of the chain on September 5, 1977.

Table 9

Monitor Time Differences (microseconds)

Monitor	Day	X	Y
Comox	82 - 97	14892.1663 ± .002	29503.2511 ± .002
	147 -161	14892.1292 ± .003	29503.2958 ± .001
North Bend	147 - 161	14902.4509 ± .002	27511.2222 ± .002
	214		27510.2769 ± .003
	215		27512.4274 ± .004
	Sept. 5 holding		27512.16
Juneau	158 - 160	11099.0604 ± .014	(4th cycle on master)
	214	11106.7584 ± .006	
	215	11110.2588 ± .004	
	Sept. 5 holding	11109.66	
Alert Bay	214	14215.3946 ± .003	29938.9441 ± .004
	215	14218.8888 ± .003	29941.0900 ± .003
	Sept. 5 holding	14218.20	29940.85

On Sept. 5th, the values to be held at Alert Bay were set and the corresponding values for Juneau and North Bend were determined. Therefore the readings at Comox for the various other dates can be simulated by applying the shifts at the other monitors.

Table 10

Monitor Time Difference (microseconds)

(Applied at Comox)

	Day	X	Y
Comox	82 - 97	14892.1663	29503.2511
	147 -161	14892.1292	29503.2958
	214	14889.8272	29502.3505
	215	14893.3245	29504.4986
	Sept. 5	14892.6807	29504.2449

A 0.5144 microsecond correction has to be added to Shoal Cove T.O.A.'s to produce what would have been observed if the chain had been controlled to final monitor values. Similarly 0.9938 microseconds has to be added to George T.O.A.'s.

Lattice Parameters

a) Charts 3902, 3802, 3744, 3668 and 366-Y (see Figure 4).

When plotting the lattice for these charts co-ordinates of the transmitters were quoted in 1927 North American Datum. The total phase lag function used was for an all seawater path assuming conductivity of 5.0 mho/metre and permittivity of 80. The land path correction was facilitated by adjusting the coding delay by a constant, for each lattice. The mean value of the observed additional secondary factor (A.S.F.) from a secondary minus the mean value of the observed A.S.F.'s from the master within the chart limits was used to correct the coding delay. Also the monitor correction had to be applied to the coding delays. The adjusted coding delays are given in Table 11.

Table 11

Adjusted Coding Delays (in microseconds)

(for charting)

Chart	X	Y
3902	10998.46	27003.07
3802	10998.30	27003.38
3744	10998.94	27003.11
3668	10999.38	27003.02
3666	-	27002.57

Overlapping lattices were checked to see that the same lines of positions (L.O.P.'s) would be less than 1 mm apart at chart scale, if one lattice were transferred on to the other.

b) Charts 3652 and 3666X. The hyperbolic A.S.F.'s on these three lattices appeared to have a systematic slope over the chart. For example the change in the correction to the X position line across Juan de Fuca entrance was found to be 2.5 microseconds. So a mean value would produce large residuals and also yield unacceptable discrepancies in overlapping areas. For these lattices a correction function was developed that was dependent on latitude and longitude (3). A tilted plane (i.e. linear function) was all that was necessary to meet the required accuracy. Higher order terms were tried but did not improve the accuracy. The coding delays were set at 11000.514 for the X pattern and 27000.994 for the Y pattern, being the nominal coding delay plus monitor corrections. The correction function, which is added to the coding delay, was:

$$\text{Corr} = a + b \times \phi + c \times\lambda + d \times \phi \times\lambda + e \times\phi^2 + f \times \lambda^2$$

ϕ = latitude (in degrees)

λ = longitude (in degrees)

a,b,c,d,e and f = constants

Corr is in microseconds.

Table 12

Lattice Correction Function Parameters

Lattice	a	b	c	d	e	f
3666 X	171.166	-0.16820	-1.28036	0	0	0
3642 X	118.049	1.10974	-1.35739	0	0	0
3642 Y	- 91.294	0.40037	0.57250	0	0	0

Comparisons were made between the lattices on adjacent charts and plotting errors were found to be less than 1 mm.

Gain Number

The gain number from the U.S.C.G. system at each satellite position fix is tabulated in Appendix A.

The signal strength can be determined from the gain number by the following equation:

$$\text{Field Strength} = 50 \times 10^{\left(\frac{110-\text{Gain\#}}{20}\right)}.$$

Cycle Number

The cycle number as determined by the U.S.C.G. system is also listed in Appendix A at most position fixes. There appears to be a drift in the cycle number from day 080 to 096 when one of the boards was changed in the

receiver bringing the cycle number back to a more reasonable value. Therefore, the values prior to the replacement of the board should not be used to determine Envelope to Cycle Discrepancy (ECD).

CONCLUSIONS

1. This calibration has demonstrated that the Satellite Navigation System can effectively enable the mapping of the Loran-C lattice for small and medium scale charts, at an accuracy of ±150 m.

2. Only in areas served by long land paths is it necessary to make more than a constant correction to provide accurate latticing for medium scale charts. Away from the coast line, currently available mathematical models are adequate for latticing purposes.

3. In critical service areas such as Juan de Fuca, where the land path to the transmitters is long, additional correction terms, linearly dependent on latitude and longitude, must be used to provide accurate chart lattices.

4. The accuracy of T.O.A. measurements depends on a good knowledge of the clock drift for the calibration frequency standards relative to the transmitter standards. This is possibly the most important factor in making both the initial overland synchronization measurements and calibration at sea. Therefore, efforts to relate clock drift to the clock's environment (temperature, vibration, etc.), would yield a high return in the accuracy of future T.O.A. measurements. It should be noted however that at no time during the calibration did the clock drift rate exceed the manufacturer's specifications.

5. As it was found to be necessary to move the chain monitor from Comox to Alert Bay after the calibration, the final chart latticing parameters are dependent on the time differences simulated at Comox. Some field checks on the accuracy of the lattice would be useful in confirming the simulation.

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WEST CANADIAN LORAN-C CHAIN

Figure I

Figure 2
C.S.S.Parizeau

C.S.S. PARIZEAU

LORAN-C CALIBRATION

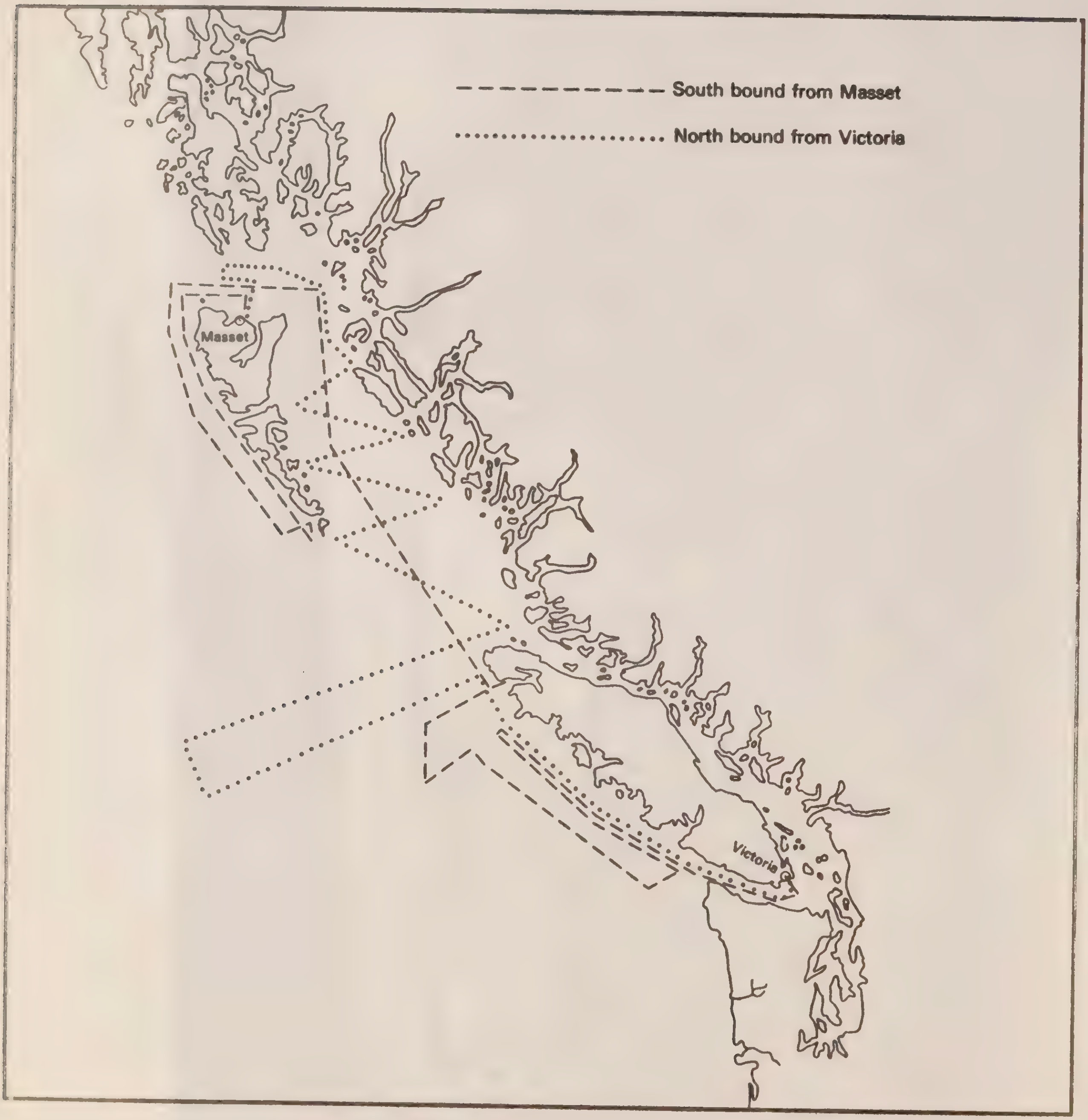

Figure 3

LORAN-C LATTICED CHARTS

1:150,000 and 1:200,000

B.C. COAST

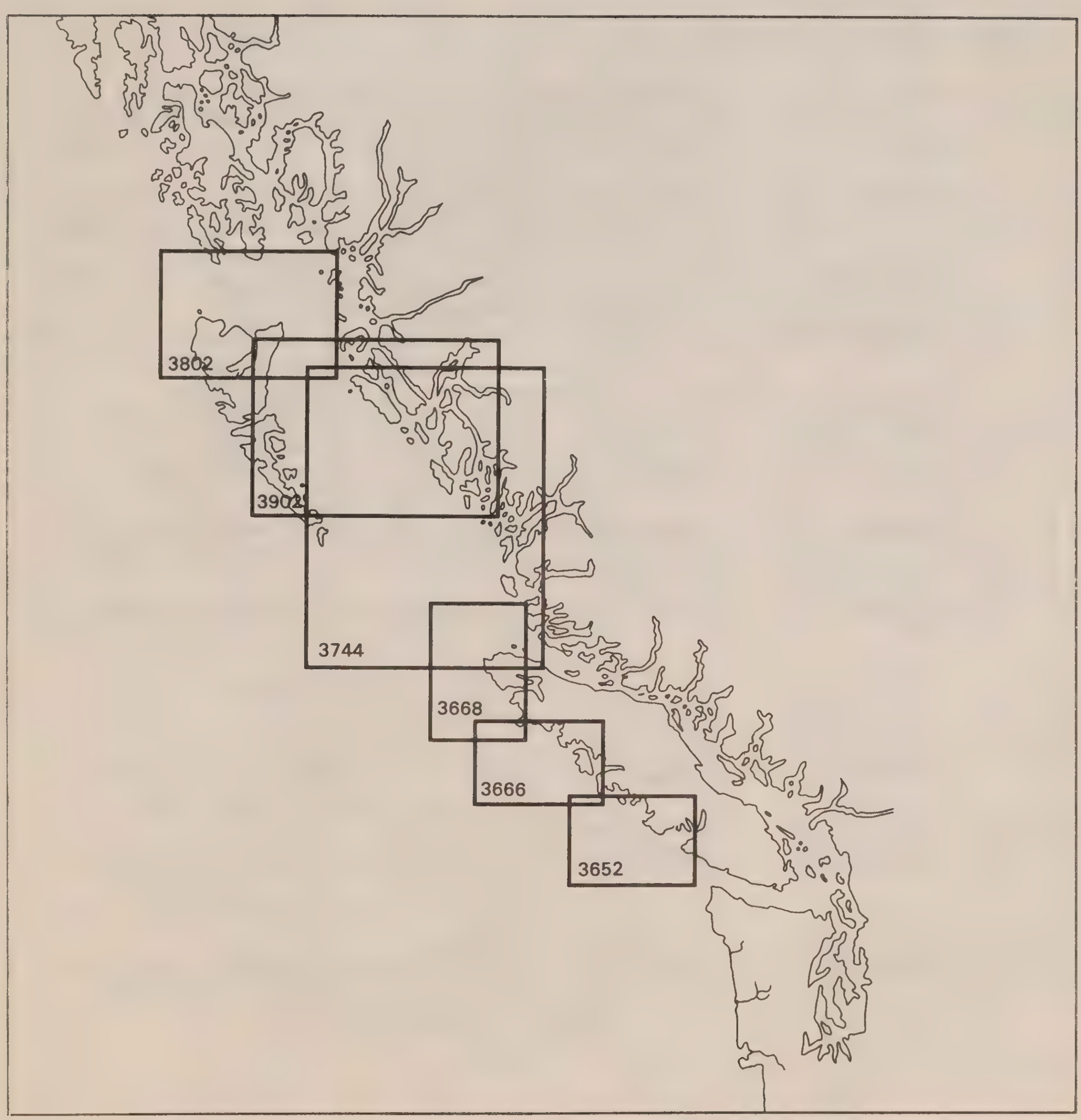

Figure 4.

APPENDIX A

EXPLANATION

Line 1 - Julian Day Number, Greenwich Mean Time (GMT), Quality of Satellite Fix in Latitude and Longitude (G=good, F=fair, P=poor, B=bad), Latitude and Longitude (degrees, minutes & seconds)

Line 4 (Williams Lake)
Line 5 (Shoal Cove)
Line 6 (George, Washington)

CYCLE	Tracking point of receiver on cycle within pulse (see written description concerning drift)
GAIN	Gain number from receiver - indirectly related to signal strength
OBS TOA	Actual observed values from receiver (except for Synchronization loops to Williams Lake and George which were adjusted by hand)
CLOCK RATE	Clock rate correction that has to be subtracted from the observed value
EMISSION DELAY	Summation of Coding Delay + Baseline Travel Time (for an all seawater path) that has to be subtracted from the observed value
CORR TOA	Corrected Time of Arrival = OBS TOA - CLOCK RATE - CLOCK SYNCH - EMISSION DELAY
CALC TOA	Calculated TOA based on all seawater path between transmitter and receiver
OBS ASF	Observed Additional Secondary Factor (or Correction) (ASF or ASC) = CORR TOA - CALC TOA
CALC ASF	Calculated ASF based on Millington's Method (over smooth earth) using the following land conductivities Williams Lake 0.0013 mho/m. Shoal Cove 0.0010 George 0.0006
MON. CORR	Change in the Time Differences (T.D.) at Monitor sites between date of survey and commission of chain
OBS T.D.	Observed hyperbolic value (Time Difference) = OBS TOA (Secondary) - OBS TOA (Master) + MON. CORR (as would be observed after chain commissioning)
CALC T.D.	Calculated Time Difference for an all seawater path = CALC TOA (Secondary) - CALC TOA (Master) + EMISSION DELAY

C 0 0 ALEXIS 52 7 4.285 123 16 9.057

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.C.
*****	0	12525.74	0.00	12309.90	0.00	215.84	214.42	1.42	1.45			
0.00	0	0.00	0.00	12308.94	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
*****	0	43300.99	0.00	12308.43	28927.37	2065.19	2060.01	5.18	5.33	0.99	30776.24	30772.96

C 0 0 RIVER 51 53 45.859 122 47 51.093

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.C.
*****	0	12413.48	0.00	12309.90	0.00	103.58	102.54	1.04	1.02			
0.00	0	0.00	0.00	12308.94	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
*****	0	43180.94	0.00	12308.43	28927.37	1945.14	1940.01	5.13	5.20	0.99	30768.45	30764.84

C 0 0 LEWIS 47 11 43.342 119 21 25.970

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.C.
*****	0	14228.27	0.00	12309.90	0.00	1918.37	1914.15	4.22	4.21			
0.00	0	0.00	0.00	12308.94	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
*****	0	41346.60	0.00	12308.43	28927.37	110.80	109.28	1.52	1.52	0.99	27119.32	27122.50

C 0 0 WHEELER 47 7 45.530 119 4 30.801

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.C.
0.00	0	14277.52	0.00	12309.90	0.00	1967.62	1963.53	4.09	4.27			
0.00	0	0.00	0.00	12308.94	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
*****	0	41408.12	0.00	12308.43	28927.37	172.32	170.98	1.34	1.86	0.99	27131.59	27134.82

C 0 0 FANCHER 47 26 59.819 120 16 50.989

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
0.00	0	0.00	0.00	12309.90	0.00	0.00	0.00	0.00	0.00			
0.00	0	0.00	0.00	12308.94	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
0.00	0	41435.06	0.00	12308.43	28927.37	199.26	197.55	1.71	2.00	0.99	0.00	0.00

C 0 0 ARLING 48 11 17.528 122 9 4.502

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
*****	0	13716.85	0.00	12309.90	0.00	1406.95	1403.83	3.12	3.60			
0.00	0	0.00	0.00	12308.94	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
*****	0	41974.39	0.00	12308.43	28927.37	738.59	734.32	4.27	3.55	0.99	28258.53	28257.86

0 0 0 BCLE EC 48 39 15.336 123 27 .855

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
*****	0	13569.30	0.00	12309.90	0.00	1259.40	1256.58	2.82	2.82			
0.00	0	0.00	0.00	12308.94	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
*****	0	42337.35	0.00	12308.43	28927.37	1101.55	1098.04	3.51	3.37	0.99	28769.04	28768.83

0 0 0 TOLMIE 48 27 25.186 123 19 28.401

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
*****	0	13635.64	0.00	12309.90	0.00	1325.74	1322.96	2.78	2.90			
0.00	0	0.00	0.00	12308.94	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
*****	0	42273.87	0.00	12308.43	28927.37	1038.07	1034.68	3.39	3.10	0.99	28639.22	28639.09

80 610 PATRICIA BAY 48 39 13.409 123 27 4.758

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.06	80	26429.14	-.48	25169.96	0.00	1259.66	1256.84	2.82	2.68			
0.00	0	0.00	-.48	25169.00	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
3.06	70	55197.07	-.48	25168.49	28927.37	1101.69	1098.17	3.52	3.46	0.99	28768.92	28768.70

80 2130 FUELLING JETTY, ESQUIMALT 48 26 29.847 123 26 50.501

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.10	79	26506.70	-.30	25169.96	0.00	1337.04	1333.92	3.12	2.80			
0.00	0	0.00	-.30	25169.00	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
3.13	67	55157.65	-.30	25168.49	28927.37	1062.09	1058.75	3.34	3.01	0.99	28651.94	28652.20

81 340 GRAVING DOCK, ESQIMALT 48 26 8.126 123 25 29.024

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.16	80	26508.10	-.23	25169.96	0.00	1338.37	1335.09	3.28	2.88			
0.00	0	0.00	-.23	25169.00	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
3.17	68	55152.01	-.23	25168.49	28927.37	1056.38	1052.76	3.62	2.96	0.99	28644.90	28645.04

83 230 WINTER HARBOUR 50 30 47.353 128 1 37.501

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.07	86	13738.83	.30	12309.90	0.00	1428.63	1425.44	3.19	3.19			
2.99	81	27622.87	.30	12308.94	13343.58	1970.05	1967.47	2.58	2.11	0.51	13884.55	13885.61
3.45	97	43642.00	.30	12308.43	28927.37	2405.90	2399.98	5.92	5.28	0.99	29904.16	29901.91

88 1820 MASSET 54 0 33.383 132 8 58.063

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.C.
3.70	91	14633.75	1.85	12309.90	0.00	2322.00	2318.81	3.19	3.95			
3.39	60	26220.72	1.85	12308.94	13343.58	566.35	565.25	1.10	1.10	0.51	11587.48	11590.02
4.03	105	45141.40	1.85	12308.43	28927.37	3903.75	3898.70	5.05	6.36	0.99	30508.64	30507.26

93 020 WINTER HARBOUR 50 30 47.223 128 1 36.841

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.C.
3.69	87	13741.53	3.01	12309.90	0.00	1428.62	1425.41	3.21	3.19			
3.51	83	27625.57	3.01	12308.94	13343.58	1970.04	1967.50	2.54	2.11	0.51	13884.55	13885.67
3.97	100	43644.66	3.01	12308.43	28927.37	2405.85	2399.93	5.92	5.28	0.99	29904.12	29901.89

96 1850 PATRICIA BAY 48 39 13.409 123 27 4.758

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.75	83	13573.60	4.04	12309.90	0.00	1259.66	1256.83	2.83	2.68			
0.00	0	0.00	4.04	12308.94	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
3.68	72	42341.51	4.04	12308.43	28927.37	1101.67	1098.17	3.50	3.46	0.99	28768.90	28768.71

81 2056 PP 48 24 40.746 124 16 24.557

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.C.
3.17	85	26570.69	-.03	25169.96	0.00	1400.76	1396.09	4.67	3.03			
5.00	97	41770.31	-.03	25169.00	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
3.12	68	55338.90	-.03	25168.49	28927.37	1243.07	1239.47	3.60	2.76	0.99	28769.20	28770.75

81 2234 GP INT 48 31 31.713 124 49 26.347

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TCA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.C.
3.14	85	26577.74	-.02	25169.96	0.00	1407.80	1405.20	2.60	2.90			
5.00	97	41788.78	-.02	25169.00	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
3.11	69	55478.59	-.02	25168.49	28927.37	1382.75	1381.44	1.31	2.74	0.99	28901.84	28903.61

81 2354 GG 48 35 48.407 125 7 9.029

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.C.
3.12	84	26585.97	-.00	25169.96	0.00	1416.01	1412.12	3.89	2.91			
5.00	97	41449.11	-.00	25169.00	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
3.10	70	55558.17	-.00	25168.49	28927.37	1462.31	1458.83	3.48	2.68	0.99	28973.19	28974.08

82 022 GG 48 37 27.113 125 13 24.015

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.11	91	26587.98	.00	25169.96	0.00	1418.02	1414.75	3.27	2.96			
5.00	0	41408.70	.00	25169.00	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
3.14	70	55585.91	.00	25168.49	28927.37	1490.05	1486.42	3.63	2.66	0.99	28998.92	28999.04

82 142 GG INT 48 44 30.966 125 29 47.794

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.C.
3.09	119	26584.61	.02	25169.96	0.00	0.00	0.00	0.00	0.00			
5.00	97	41333.79	.02	25169.00	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
3.26	127	55664.01	.02	25168.49	28927.37	1568.13	1564.83	3.30	2.51	0.99	0.00	0.00

82 230 GG 48 45 13.448 125 31 32.309

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.C.
3.16	85	13721.92	.03	12309.90	0.00	1411.99	1409.16	2.83	2.80			
3.75	99	28482.82	.03	12308.94	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
3.13	71	42812.23	.03	12308.43	28927.37	1576.40	1573.06	3.34	2.51	0.99	29091.30	29091.27

82 324 GP 48 50 1.577 125 42 53.401

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.19	91	13720.85	.04	12309.90	0.00	1410.91	1408.57	2.34	2.93			
5.00	0	28437.22	.04	12308.94	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
3.11	72	42864.64	.04	12308.43	28927.37	1628.80	1627.13	1.67	2.48	0.99	29144.78	29145.93

82 422 GG 48 55 27.627 125 54 19.651

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TCA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.17	86	13720.04	.05	12309.90	0.00	1410.09	1406.96	3.13	2.97			
4.32	107	28356.37	.05	12308.94	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
3.10	73	42922.21	.05	12308.43	28927.37	1686.36	1682.95	3.41	2.49	0.99	29203.16	29203.36

82 510 GG 49 0 22.115 126 3 58.685

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.13	86	13719.14	.06	12309.90	0.00	1409.18	1405.69	3.49	2.82			
3.90	115	28301.92	.06	12308.94	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
3.13	73	42970.93	.06	12308.43	28927.37	1735.07	1730.80	4.27	2.95	0.99	29252.78	29252.48

82 6 8 GG INT 49 6 2.806 126 16 16.593

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.13	86	13722.54	.07	12309.90	0.00	1412.57	1409.14	3.43	2.77			
3.68	114	28249.97	.07	12308.94	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
3.13	74	43030.08	.07	12308.43	28927.37	1794.21	1790.43	3.78	3.28	0.99	29308.53	29308.66

82 936 GG 49 27 29.004 127 0 58.175

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.11	86	13751.27	.11	12309.90	0.00	1441.26	1438.25	3.01	2.97			
0.00	88	28076.59	.11	12308.94	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
3.14	79	43249.19	.11	12308.43	28927.37	2013.28	2008.87	4.41	3.25	0.99	29498.91	29497.99

82 1122 GG 49 39 2.262 127 23 6.694

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.14	86	13773.60	.13	12309.90	0.00	1463.57	1460.48	3.09	2.83			
3.04	85	27976.78	.13	12308.94	13343.58	2324.13	2321.21	2.92	2.04	0.51	14203.69	14204.31
3.25	83	43359.99	.13	12308.43	28927.37	2124.06	2119.28	4.78	3.38	0.99	29587.38	29586.17

82 12 0 GG 49 43 7.189 127 30 46.393

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.13	87	13782.33	.14	12309.90	0.00	1472.29	1469.66	2.63	2.96			
2.98	85	27942.00	.14	12308.94	13343.58	2289.34	2286.79	2.55	1.94	0.51	14160.18	14160.71
3.36	84	43398.18	.14	12308.43	28927.37	2162.24	2157.69	4.55	3.49	0.99	29616.84	29615.40

82 1310 PP 49 51 17.701 127 45 24.632

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.12	86	13801.51	.15	12309.90	0.00	1491.46	1488.42	3.04	3.03			
2.97	82	27874.90	.15	12308.94	13343.58	2222.23	2219.27	2.96	1.82	0.51	14073.90	14074.43
3.39	85	43471.78	.15	12308.43	28927.37	2235.83	2232.02	3.81	3.73	0.99	29671.26	29670.97

82 1348 FF 49 55 51.848 127 53 43.328

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.14	87	13814.32	.16	12309.90	0.00	1504.26	1500.81	3.45	3.02			
2.98	81	27836.10	.16	12308.94	13343.58	2183.42	2181.62	1.80	1.89	0.51	14022.29	14024.39
3.29	86	43514.85	.16	12308.43	28927.37	2278.89	2274.02	4.87	3.76	0.99	29701.52	29700.58

82 1436 GG 50 1 47.959 128 5 52.295

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.17	87	13836.47	.17	12309.90	0.00	1526.40	1523.10	3.30	3.21			
2.98	78	27784.75	.17	12308.94	13343.58	2132.06	2131.32	.74	1.53	0.51	13948.79	13951.80
3.21	86	43574.59	.17	12308.43	28927.37	2338.62	2333.47	5.15	3.81	0.99	29739.11	29737.74

82 1518 GG 50 10 17.542 128 9 43.751

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.11	85	13823.92	.17	12309.90	0.00	1513.85	1510.69	3.16	2.99			
2.99	79	27731.14	.17	12308.94	13343.58	2078.45	2076.59	1.86	1.53	0.51	13907.73	13909.48
3.32	89	43610.35	.17	12308.43	28927.37	2374.38	2369.92	4.46	3.77	0.99	29787.42	29786.60

82 1538 FF INT 50 14 3.023 128 11 11.881

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.08	84	13818.64	.18	12309.90	0.00	1508.56	1504.93	3.63	2.97			
3.02	79	27707.59	.18	12308.94	13343.58	2054.89	2052.67	2.22	1.53	0.51	13889.46	13891.32
3.29	90	43625.92	.18	12308.43	28927.37	2389.94	2385.39	4.55	4.15	0.99	29808.27	29807.83

82 1622 GP INT 50 20 58.759 128 8 11.931

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.05	82	13787.32	.19	12309.90	0.00	1477.23	1474.92	2.31	2.98			
3.00	79	27670.79	.19	12308.94	13343.58	2018.08	2015.88	2.20	1.67	0.51	13883.98	13884.54
3.34	92	43634.66	.19	12308.43	28927.37	2398.67	2394.16	4.51	4.51	0.99	29848.33	29846.61

83 1722 BB 50 28 43.883 128 13 19.166

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.19	84	13786.00	.47	12309.90	0.00	1475.63	1472.76	2.87	3.14			
3.09	79	27618.09	.47	12308.94	13343.58	1965.10	1963.92	1.18	1.92	0.51	13832.60	13834.74
3.39	95	43676.05	.47	12308.43	28927.37	2439.78	2434.43	5.35	4.73	0.99	29891.04	29889.04

83 1742 PP 50 30 42.089 128 20 14.650

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.11	83	13805.93	.47	12309.90	0.00	1495.56	1492.82	2.74	3.15			
3.07	78	27598.89	.47	12308.94	13343.58	1945.90	1943.57	2.33	1.53	0.51	13793.47	13794.33
5.00	89	43703.64	.47	12308.43	28927.37	2467.37	2464.30	3.07	4.64	0.99	29898.70	29898.85

83 1928 PP INT 50 30 53.754 128 48 26.722

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.15	84	13909.05	.49	12309.90	0.00	1598.66	1594.91	3.75	3.01			
3.02	75	27562.91	.49	12308.94	13343.58	1909.90	1909.66	.24	1.11	0.51	13654.37	13658.33
3.31	91	43804.73	.49	12308.43	28927.37	2568.44	2563.84	4.60	4.12	0.99	29896.67	29896.30

83 2046 GG INT 50 26 33.370 129 6 27.961

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.17	85	13983.40	.51	12309.90	0.00	1672.99	1670.95	2.04	2.92			
3.02	75	27571.04	.51	12308.94	13343.58	1918.01	1917.57	.44	1.09	0.51	13588.15	13590.20
3.26	89	43856.73	.51	12308.43	28927.37	2620.42	2616.27	4.15	3.60	0.99	29874.32	29872.69

83 2046 R GG INT 50 26 38.590 129 6 23.461

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.17	85	13983.40	.51	12309.90	0.00	1672.99	1670.47	2.52	2.92			
3.02	75	27571.04	.51	12308.94	13343.58	1918.01	1917.12	.89	1.09	0.51	13588.15	13590.23
3.26	89	43856.73	.51	12308.43	28927.37	2620.42	2616.23	4.19	3.60	0.99	29874.32	29873.13

84 0 4 GG 50 16 11.512 129 52 16.027

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.18	86	14175.53	.55	12309.90	0.00	1865.08	1863.07	2.01	2.79			
3.09	76	27598.70	.55	12308.94	13343.58	1945.63	1945.40	.23	.60	0.51	13423.68	13425.91
3.24	85	43997.56	.55	12308.43	28927.37	2761.21	2757.40	3.81	2.98	0.99	29823.02	29821.70

84 140 PP 50 11 3.013 130 15 30.161

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.17	86	14272.53	.57	12309.90	0.00	1962.06	1960.46	1.60	2.76			
3.05	74	27618.34	.57	12308.94	13343.58	1965.25	1965.08	.17	.63	0.51	13346.32	13348.20
3.24	83	44071.60	.57	12308.43	28927.37	2835.23	2832.26	2.97	2.85	0.99	29800.06	29799.17

84 238 FF 50 8 .805 130 29 42.804

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.18	86	14332.27	.58	12309.90	0.00	2021.79	2019.84	1.95	2.73			
3.00	74	27631.61	.58	12308.94	13343.58	1978.51	1978.48	.03	.62	0.51	13299.85	13302.22
3.21	82	44118.66	.58	12308.43	28927.37	2882.28	2879.16	3.12	2.59	0.99	29787.38	29786.69

84 326 GG 50 5 38.136 130 41 16.931

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.17	87	14380.59	.59	12309.90	0.00	2070.10	2067.99	2.11	2.72			
3.00	75	27643.31	.59	12308.94	13343.58	1990.20	1989.91	.29	.66	0.51	13263.23	13265.50
3.21	82	44157.40	.59	12308.43	28927.37	2921.01	2918.00	3.01	2.33	0.99	29777.80	29777.38

84 352 GG 50 4 18.342 130 47 49.023

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.20	86	14407.84	.59	12309.90	0.00	2097.35	2095.18	2.17	2.71			
3.02	74	27650.25	.59	12308.94	13343.58	1997.14	1996.72	.42	.43	0.51	13242.92	13245.12
3.23	82	44179.47	.59	12308.43	28927.37	2943.08	2940.14	2.94	2.26	0.99	29772.62	29772.33

84 352 R GG 50 4 17.682 130 47 45.843

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.20	86	14407.84	.59	12309.90	0.00	2097.35	2095.01	2.34	2.71			
3.02	74	27650.25	.59	12308.94	13343.58	1997.14	1996.80	.34	.43	0.51	13242.92	13245.37
3.23	82	44179.47	.59	12308.43	28927.37	2943.08	2939.91	3.17	2.26	0.99	29772.62	29772.27

84 424 GP INT 50 2 34.909 130 55 34.734

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.18	86	14441.19	.60	12309.90	0.00	2130.69	2127.82	2.87	2.71			
3.01	74	27659.76	.60	12308.94	13343.58	2006.64	2006.09	.55	.56	0.51	13219.08	13221.85
3.24	83	44206.25	.60	12308.43	28927.37	2969.85	2966.31	3.54	2.28	0.99	29766.05	29765.86

84 514 GG 49 59 51.720 131 8 11.200

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.19	87	14493.67	.61	12309.90	0.00	2183.16	2180.69	2.47	2.69			
3.03	75	27675.64	.61	12308.94	13343.58	2022.51	2021.75	.76	.52	0.51	13182.48	13184.64
3.22	83	44248.85	.61	12308.43	28927.37	3012.44	3009.35	3.09	2.32	0.99	29756.17	29756.03

84 536 GG 49 58 38.285 131 13 35.854

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.18	87	14516.43	.61	12309.90	0.00	2205.92	2203.53	2.39	2.69			
3.03	75	27683.07	.61	12308.94	13343.58	2029.94	2029.16	.78	.57	0.51	13167.15	13169.21
3.21	83	44267.28	.61	12308.43	28927.37	3030.87	3027.86	3.01	2.38	0.99	29751.84	29751.70

84 536 R GG 49 58 37.925 131 13 38.074

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.18	87	14516.43	.61	12309.90	0.00	2205.92	2203.68	2.24	2.69			
3.03	75	27683.07	.61	12308.94	13343.58	2029.94	2029.20	.74	.57	0.51	13167.15	13169.10
3.21	83	44267.28	.61	12308.43	28927.37	3030.87	3027.99	2.88	2.38	0.99	29751.84	29751.68

84 612 FF 49 56 41.233 131 22 11.425

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.C.
3.18	88	14552.98	.62	12309.90	0.00	2242.46	2239.83	2.63	2.67			
3.03	76	27695.85	.62	12308.94	13343.58	2042.71	2041.39	1.32	.64	0.51	13143.38	13145.14
3.21	83	44296.77	.62	12308.43	28927.37	3060.35	3057.41	2.94	2.40	0.99	29744.78	29744.95

84 932 GG 49 45 12.357 132 10 14.974

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.20	89	14757.42	.66	12309.90	0.00	2446.86	2444.61	2.25	2.63			
3.08	78	27776.35	.66	12308.94	13343.58	2123.17	2122.40	.77	.88	0.51	13019.44	13021.37
3.25	83	44465.53	.66	12308.43	28927.37	3229.07	3225.56	3.51	2.84	0.99	29709.10	29708.32

84 932 R GG 49 45 13.137 132 10 20.374

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.20	89	14757.42	.66	12309.90	0.00	2446.86	2444.91	1.95	2.63			
3.08	78	27776.35	.66	12308.94	13343.58	2123.17	2122.36	.81	.88	0.51	13019.44	13021.03
3.25	83	44465.53	.66	12308.43	28927.37	3229.07	3225.93	3.14	2.84	0.99	29709.10	29708.39

84 1118 FF 49 39 34.219 132 35 16.328

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.19	90	14863.63	.68	12309.90	0.00	2553.05	2550.64	2.41	2.61			
3.14	79	27822.37	.68	12308.94	13343.58	2169.17	2168.22	.95	.76	0.51	12959.25	12961.16
3.24	85	44556.39	.68	12308.43	28927.37	3319.91	3315.94	3.97	2.85	0.99	29693.75	29692.67

84 1118 R FF 49 39 38.060 132 35 23.828

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.19	90	14863.63	.68	12309.90	0.00	2553.05	2550.94	2.11	2.61			
3.14	79	27822.37	.68	12308.94	13343.58	2169.17	2167.89	1.28	.76	0.51	12959.25	12960.53
3.24	85	44556.39	.68	12308.43	28927.37	3319.91	3316.51	3.40	2.85	0.99	29693.75	29692.94

84 1210 FF 49 36 51.691 132 47 38.335

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.17	90	14915.81	.69	12309.90	0.00	2605.22	2602.90	2.32	2.61			
3.17	80	27846.33	.69	12308.94	13343.58	2193.12	2191.75	1.37	.78	0.51	12931.03	12932.43
3.21	85	44601.42	.69	12308.43	28927.37	3364.93	3361.22	3.71	2.82	0.99	29686.60	29685.69

84 1210 R FF 49 36 46.471 132 47 43.855

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.17	90	14915.81	.69	12309.90	0.00	2605.22	2603.46	1.76	2.61			
3.17	80	27846.33	.69	12308.94	13343.58	2193.12	2192.34	.78	.78	0.51	12931.03	12932.46
3.21	85	44601.42	.69	12308.43	28927.37	3364.93	3361.48	3.45	2.82	0.99	29686.60	29685.39

84 1446 FF 49 27 58.565 133 25 49.037

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.20	91	15078.76	.71	12309.90	0.00	2768.15	2765.82	2.33	2.58			
3.08	78	27927.57	.71	12308.94	13343.58	2274.34	2272.97	1.37	1.33	0.51	12849.32	12850.73
3.27	87	44743.22	.71	12308.43	28927.37	3506.71	3502.47	4.24	2.80	0.99	29665.45	29664.02

84 1446 R FF 49 28 4.505 133 25 46.097

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.20	91	15078.76	.71	12309.90	0.00	2768.15	2765.39	2.76	2.58			
3.08	78	27927.57	.71	12308.94	13343.58	2274.34	2272.33	2.01	1.33	0.51	12849.32	12850.52
3.27	87	44743.22	.71	12308.43	28927.37	3506.71	3502.38	4.33	2.80	0.99	29665.45	29664.36

84 1530 FF 49 32 10.691 133 31 46.619

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.20	91	15090.42	.72	12309.90	0.00	2779.80	2777.47	2.33	2.43			
3.09	78	27907.65	.72	12308.94	13343.58	2254.41	2252.54	1.87	1.33	0.51	12817.74	12818.65
3.23	87	44770.99	.72	12308.43	28927.37	3534.47	3530.53	3.94	2.80	0.99	29681.56	29680.43

84 1642 PP 49 43 59.117 133 36 54.805

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.19	91	15080.78	.74	12309.90	0.00	2770.14	2768.62	1.52	2.41			
3.08	80	27840.47	.74	12308.94	13343.58	2187.21	2185.83	1.38	1.22	0.51	12760.20	12760.79
3.28	89	44803.60	.74	12308.43	28927.37	3567.06	3563.94	3.12	2.84	0.99	29723.81	29722.69

84 1718 GG 49 49 53.540 133 39 15.488

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.C.
3.24	91	15077.06	.74	12309.90	0.00	2766.42	2764.06	2.36	2.42			
3.07	78	27807.56	.74	12308.94	13343.58	2154.30	2152.46	1.84	1.23	0.51	12731.01	12731.98
3.27	87	44820.42	.74	12308.43	28927.37	3583.88	3580.20	3.68	2.84	0.99	29744.35	29743.51

84 1718 R GG 49 49 51.860 133 39 16.028

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.24	91	15077.06	.74	12309.90	0.00	2766.42	2764.16	2.26	2.42			
3.07	78	27807.56	.74	12308.94	13343.58	2154.30	2152.64	1.66	1.23	0.51	12731.01	12732.06
3.27	87	44820.42	.74	12308.43	28927.37	3583.88	3580.21	3.67	2.84	0.99	29744.35	29743.42

84 1824 FF 50 0 38.665 133 44 9.696

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.17	90	15071.73	.76	12309.90	0.00	2761.07	2759.34	1.73	2.45			
3.01	79	27747.92	.76	12308.94	13343.58	2094.64	2092.68	1.96	1.21	0.51	12676.70	12676.92
3.26	86	44852.15	.76	12308.43	28927.37	3615.59	3612.99	2.60	2.78	0.99	29781.41	29781.02

84 2138 FF 50 18 45.537 133 14 52.659

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.18	90	14925.71	.79	12309.90	0.00	2615.02	2613.09	1.93	2.38			
3.07	77	27611.14	.79	12308.94	13343.58	1957.83	1956.45	1.38	1.36	0.51	12685.94	12686.94
3.25	87	44765.35	.79	12308.43	28927.37	3528.76	3525.99	2.77	2.38	0.99	29840.63	29840.27

84 2138 R FF 50 18 43.437 133 14 54.280

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.C.
3.18	90	14925.71	.79	12309.90	0.00	2615.02	2613.26	1.76	2.38			
3.07	77	27611.14	.79	12308.94	13343.58	1957.83	1956.69	1.14	1.36	0.51	12685.94	12687.01
3.25	87	44765.35	.79	12308.43	28927.37	3528.76	3526.04	2.72	2.38	0.99	29840.63	29840.15

84 2320 GG 50 22 39.390 132 45 51.915

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.21	89	14809.03	.81	12309.90	0.00	2498.32	2496.28	2.04	2.41			
3.21	77	27565.08	.81	12308.94	13343.58	1911.75	1910.75	1.00	.91	0.51	12756.56	12758.05
3.29	87	44661.20	.81	12308.43	28927.37	3424.59	3421.62	2.97	2.30	0.99	29853.16	29852.71

84 2320 R GG 50 22 38.850 132 45 53.115

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.21	89	14809.03	.81	12309.90	0.00	2498.32	2496.37	1.95	2.41			
3.21	77	27565.08	.81	12308.94	13343.58	1911.75	1910.81	.94	.91	0.51	12756.56	12758.02
3.29	87	44661.20	.81	12308.43	28927.37	3424.59	3421.68	2.91	2.30	0.99	29853.16	29852.68

85 1 0 GG 50 25 39.723 132 17 3.534

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.22	88	14694.75	.83	12309.90	0.00	2384.02	2382.04	1.98	2.39			
3.16	76	27530.50	.83	12308.94	13343.58	1877.15	1876.15	1.00	.82	0.51	12836.26	12837.69
3.31	86	44557.28	.83	12308.43	28927.37	3320.65	3317.76	2.89	2.35	0.99	29863.52	29863.09

85 1 0 R GG 50 25 39.903 132 17 4.553

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.C.
3.22	88	14694.75	.83	12309.90	0.00	2384.02	2382.10	1.92	2.39			
3.16	76	27530.50	.83	12308.94	13343.58	1877.15	1876.14	1.01	.82	0.51	12836.26	12837.62
3.31	86	44557.28	.83	12308.43	28927.37	3320.65	3317.83	2.82	2.35	0.99	29863.52	29863.10

85 150 BB 50 27 9.710 132 2 26.293

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.23	87	14637.66	.84	12309.90	0.00	2326.92	2324.16	2.76	2.44			
3.16	75	27514.29	.84	12308.94	13343.58	1860.93	1860.97	-.04	.77	0.51	12877.14	12880.39
3.30	85	44506.57	.84	12308.43	28927.37	3269.93	3265.47	4.46	2.63	0.99	29869.90	29868.68

85 234 GG 50 28 58.838 131 50 32.968

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.20	86	14588.80	.85	12309.90	0.00	2278.05	2275.99	2.06	2.50			
3.10	75	27500.32	.85	12308.94	13343.58	1846.95	1846.06	.89	.57	0.51	12912.03	12913.65
3.25	85	44464.18	.85	12308.43	28927.37	3227.53	3224.37	3.16	2.81	0.99	29876.37	29875.75

85 336 GG 50 31 35.243 131 33 53.928

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.23	86	14521.14	.86	12309.90	0.00	2210.38	2208.45	1.93	2.52			
3.07	74	27480.51	.86	12308.94	13343.58	1827.13	1826.54	.59	.61	0.51	12959.88	12961.67
3.27	85	44407.62	.86	12308.43	28927.37	3170.96	3167.43	3.53	2.86	0.99	29887.47	29886.35

85 336 R GG 50 31 34.643 131 33 51.829

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.23	86	14521.14	.86	12309.90	0.00	2210.38	2208.34	2.04	2.52			
3.07	74	27480.51	.86	12308.94	13343.58	1827.13	1826.60	.53	.61	0.51	12959.88	12961.84
3.27	85	44407.62	.86	12308.43	28927.37	3170.96	3167.28	3.68	2.86	0.99	29887.47	29886.31

85 422 GG 50 33 58.632 131 22 8.702

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.19	86	14472.75	.87	12309.90	0.00	2161.98	2159.79	2.19	2.53			
3.04	73	27464.63	.87	12308.94	13343.58	1811.24	1810.60	.64	.66	0.51	12992.39	12994.39
3.25	85	44369.39	.87	12308.43	28927.37	3132.72	3128.77	3.95	2.88	0.99	29897.63	29896.35

85 522 GG 50 37 5.098 131 6 47.300

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.C.
3.21	86	14408.61	.88	12309.90	0.00	2097.83	2096.29	1.54	2.54			
3.03	73	27445.36	.88	12308.94	13343.58	1791.96	1791.45	.51	.54	0.51	13037.26	13038.74
3.28	87	44319.16	.88	12308.43	28927.37	3082.48	3078.84	3.64	2.91	0.99	29911.54	29909.92

8E 522 R GG 50 37 4.198 131 6 39.200

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.21	86	14408.61	.88	12309.90	0.00	2097.83	2095.81	2.02	2.54			
3.03	73	27445.36	.88	12308.94	13343.58	1791.96	1791.56	.40	.54	0.51	13037.26	13039.33
3.28	87	44319.16	.88	12308.43	28927.37	3082.48	3078.31	4.17	2.91	0.99	29911.54	29909.87

8E 522 R GG 50 37 5.878 131 6 41.480

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.21	86	14408.61	.88	12309.90	0.00	2097.83	2095.90	1.93	2.54			
3.03	73	27445.36	.88	12308.94	13343.58	1791.96	1791.38	.58	.54	0.51	13037.26	13039.06
3.28	87	44319.16	.88	12308.43	28927.37	3082.48	3078.51	3.97	2.91	0.99	29911.54	29909.98

8E 618 GG 50 39 55.664 130 52 16.237

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.19	86	14349.48	.89	12309.90	0.00	2038.69	2036.50	2.19	2.56			
3.05	74	27429.41	.89	12308.94	13343.58	1776.00	1775.64	.36	.54	0.51	13080.44	13082.72
3.29	89	44273.17	.89	12308.43	28927.37	3036.48	3032.07	4.41	3.09	0.99	29924.68	29922.94

8E 618 R GG 50 39 54.944 130 52 13.357

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.19	86	14349.48	.89	12309.90	0.00	2038.69	2036.34	2.35	2.56			
3.05	74	27429.41	.89	12308.94	13343.58	1776.00	1775.72	.28	.54	0.51	13080.44	13082.96
3.29	89	44273.17	.89	12308.43	28927.37	3036.48	3031.86	4.62	3.09	0.99	29924.68	29922.89

8E 838 GG 50 45 57.070 130 15 21.563

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.20	85	14199.86	.92	12309.90	0.00	1889.04	1886.85	2.19	2.61			
3.07	72	27404.58	.92	12308.94	13343.58	1751.14	1750.51	.63	.46	0.51	13205.23	13207.24
3.36	91	44153.73	.92	12308.43	28927.37	2917.01	2913.03	3.98	3.47	0.99	29954.86	29953.55

8E 838 R GG 50 45 58.150 130 15 20.423

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.20	85	14199.86	.92	12309.90	0.00	1889.04	1886.75	2.29	2.61			
3.07	72	27404.58	.92	12308.94	13343.58	1751.14	1750.41	.73	.46	0.51	13205.23	13207.24
3.36	91	44153.73	.92	12308.43	28927.37	2917.01	2913.00	4.01	3.47	0.99	29954.86	29953.62

8E 1024 FP INT 50 51 23.265 129 48 .417

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.21	84	14086.88	.94	12309.90	0.00	1776.04	1774.43	1.61	2.65			
3.16	73	27387.16	.94	12308.94	13343.58	1733.70	1733.21	.49	.57	0.51	13300.79	13302.36
3.39	92	44070.54	.94	12308.43	28927.37	2833.80	2830.01	3.79	4.00	0.99	29984.65	29982.95

8E 1122 PP 50 54 18.031 129 32 53.115

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.21	84	14025.48	.95	12309.90	0.00	1714.63	1712.53	2.10	2.69			
3.07	73	27380.83	.95	12308.94	13343.58	1727.36	1726.96	.40	.97	0.51	13355.86	13358.01
3.38	93	44026.23	.95	12308.43	28927.37	2789.48	2785.03	4.45	4.20	0.99	30001.74	29999.87

8E 1122 R PP 50 54 14.251 129 33 .555

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.21	84	14025.48	.95	12309.90	0.00	1714.63	1713.11	1.52	2.69			
3.07	73	27380.83	.95	12308.94	13343.58	1727.36	1727.24	.12	.97	0.51	13355.86	13357.71
3.38	93	44026.23	.95	12308.43	28927.37	2789.48	2785.29	4.19	4.20	0.99	30001.74	29999.55

8E 1210 GG 50 56 26.179 129 19 47.133

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.21	83	13972.45	.96	12309.90	0.00	1661.59	1659.62	1.97	2.72			
3.07	72	27379.58	.96	12308.94	13343.58	1726.10	1725.47	.63	.98	0.51	13407.64	13409.43
3.42	95	43987.03	.96	12308.43	28927.37	2750.27	2745.63	4.64	4.40	0.99	30015.57	30013.38

85 1210 R GG 50 56 27.679 129 19 44.733

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MCN. CORR	OBS T.C.	CALC T.D.
3.21	83	13972.45	.96	12309.90	0.00	1661.59	1659.42	2.17	2.72			
3.07	72	27379.58	.96	12308.94	13343.58	1726.10	1725.35	.75	.98	0.51	13407.64	13409.51
3.42	95	43987.03	.96	12308.43	28927.37	2750.27	2745.56	4.71	4.40	0.99	30015.57	30013.51

85 13 8 GF 50 58 6.184 129 3 28.316

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.20	84	13907.88	.97	12309.90	0.00	1597.01	1595.46	1.55	2.77			
3.08	74	27386.39	.97	12308.94	13343.58	1732.90	1731.56	1.34	1.18	0.51	13479.02	13479.68
3.38	93	43935.72	.97	12308.43	28927.37	2698.95	2694.43	4.52	4.61	0.99	30028.83	30026.34

85 1358 FF 50 59 47.091 128 49 32.116

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.C.
3.19	83	13853.33	.98	12309.90	0.00	1542.45	1540.24	2.21	2.81			
3.12	75	27391.59	.98	12308.94	13343.58	1738.09	1736.92	1.17	1.48	0.51	13538.77	13540.26
3.39	92	43894.00	.98	12308.43	28927.37	2657.22	2652.09	5.13	4.56	0.99	30041.66	30039.22

85 1358 R FF 50 59 51.351 128 49 32.056

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MCN. CORR	OBS T.D.	CALC T.D.
3.19	83	13853.33	.98	12309.90	0.00	1542.45	1540.12	2.33	2.81			
3.12	75	27391.59	.98	12308.94	13343.58	1738.09	1736.51	1.58	1.48	0.51	13538.77	13539.97
3.39	92	43894.00	.98	12308.43	28927.37	2657.22	2652.30	4.92	4.56	0.99	30041.66	30039.55

85 1440 GG 51 1 37.421 128 38 18.031

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MCN. CORR	OBS T.D.	CALC T.C.
3.21	83	13808.00	.99	12309.90	0.00	1497.11	1494.93	2.18	2.86			
3.16	75	27394.58	.99	12308.94	13343.58	1740.99	1739.55	1.44	1.49	0.51	13587.01	13588.20
3.25	91	43861.62	.99	12308.43	28927.37	2624.83	2619.94	4.89	4.73	0.99	30054.61	30052.38

85 1456 GG 51 2 23.617 128 33 55.597

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.21	83	13790.31	.99	12309.90	0.00	1479.42	1477.20	2.22	2.88			
3.14	77	27395.36	.99	12308.94	13343.58	1741.85	1740.54	1.31	1.42	0.51	13605.56	13606.92
3.36	90	43849.33	.99	12308.43	28927.37	2612.54	2607.73	4.81	4.49	0.99	30060.01	30057.90

85 1456 R GG 51 2 25.477 128 33 52.477

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.21	83	13790.31	.99	12309.90	0.00	1479.42	1476.96	2.46	2.88			
3.14	77	27395.36	.99	12308.94	13343.58	1741.85	1740.43	1.42	1.42	0.51	13605.56	13607.05
3.36	90	43849.33	.99	12308.43	28927.37	2612.54	2607.66	4.88	4.49	0.99	30060.01	30058.07

85 1528 GG 51 3 47.849 128 24 50.450

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.21	83	13754.03	1.00	12309.90	0.00	1443.13	1440.72	2.41	2.92			
3.21	77	27399.19	1.00	12308.94	13343.58	1745.67	1744.24	1.43	1.42	0.51	13645.67	13647.10
3.40	89	43823.45	1.00	12308.43	28927.37	2586.65	2581.99	4.66	4.41	0.99	30070.41	30068.64

85 1542 FF 51 4 22.886 128 21 5.095

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.25	84	13738.53	1.00	12309.90	0.00	1427.63	1425.64	1.99	2.95			
3.24	78	27401.37	1.00	12308.94	13343.58	1747.85	1745.95	1.90	1.46	0.51	13663.35	13663.89
3.38	88	43812.21	1.00	12308.43	28927.37	2575.41	2571.46	3.95	4.10	0.99	30074.67	30073.19

85 1626 GG 51 6 18.614 128 8 49.932

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.25	84	13690.16	1.01	12309.90	0.00	1379.25	1376.43	2.82	3.03			
3.15	78	27407.69	1.01	12308.94	13343.58	1754.16	1752.17	1.99	2.17	0.51	13718.04	13719.32
3.30	86	43778.56	1.01	12308.43	28927.37	2541.75	2537.58	4.17	3.38	0.99	30089.39	30088.52

85 1712 GG 51 8 47.896 128 11 19.562

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.24	84	13695.39	1.02	12309.90	0.00	1384.47	1381.72	2.75	3.00			
3.14	79	27389.56	1.02	12308.94	13343.58	1736.02	1734.25	1.77	2.17	0.51	13694.68	13696.11
3.32	86	43795.11	1.02	12308.43	28927.37	2558.29	2554.12	4.17	3.30	0.99	30100.71	30099.77

85 1712 R GG 51 8 47.596 128 11 7.802

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.24	84	13695.39	1.02	12309.90	0.00	1384.47	1380.99	3.48	3.00			
3.14	79	27389.56	1.02	12308.94	13343.58	1736.02	1734.57	1.45	2.17	0.51	13694.68	13697.16
3.32	86	43795.11	1.02	12308.43	28927.37	2558.29	2553.46	4.83	3.30	0.99	30100.71	30099.84

85 1734 FF 51 9 41.362 128 17 33.409

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.25	83	13717.83	1.02	12309.90	0.00	1406.91	1403.77	3.14	2.94			
3.16	78	27375.70	1.02	12308.94	13343.58	1722.16	1720.18	1.98	1.55	0.51	13658.38	13659.99
3.31	85	43818.63	1.02	12308.43	28927.37	2581.81	2577.48	4.33	4.44	0.99	30101.79	30101.08

85 1734 R FF 51 9 39.262 128 17 33.829

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.25	83	13717.83	1.02	12309.90	0.00	1406.91	1403.85	3.06	2.94			
3.16	78	27375.70	1.02	12308.94	13343.58	1722.16	1720.38	1.78	1.55	0.51	13658.38	13660.11
3.31	85	43818.63	1.02	12308.43	28927.37	2581.81	2577.38	4.43	4.44	0.99	30101.79	30100.90

85 1734 R FF 51 9 38.842 128 17 33.169

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.25	83	13717.83	1.02	12309.90	0.00	1406.91	1403.82	3.09	2.94			
3.16	78	27375.70	1.02	12308.94	13343.58	1722.16	1720.43	1.73	1.55	0.51	13658.38	13660.19
3.31	85	43818.63	1.02	12308.43	28927.37	2581.81	2577.33	4.48	4.44	0.99	30101.79	30100.88

85 1816 BB INT 51 11 .692 128 29 35.545

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.26	83	13759.44	1.03	12309.90	0.00	1448.51	1447.13	1.38	2.73			
3.19	77	27350.33	1.03	12308.94	13343.58	1696.78	1695.94	.84	1.46	0.51	13591.40	13592.39
3.36	87	43862.42	1.03	12308.43	28927.37	2625.59	2621.36	4.23	3.60	0.99	30103.97	30101.60

85 1858 BB INT 51 12 43.362 128 40 48.182

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.25	83	13799.18	1.04	12309.90	0.00	1488.24	1487.01	1.23	2.83			
3.14	76	27325.56	1.04	12308.94	13343.58	1672.00	1671.35	.65	1.45	0.51	13526.89	13527.92
3.45	88	43905.13	1.04	12308.43	28927.37	2668.29	2663.94	4.35	4.01	0.99	30106.94	30104.30

85 2042 PP 51 18 35.524 129 6 33.005

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.19	83	13890.68	1.06	12309.90	0.00	1579.72	1576.87	2.85	2.70			
3.14	73	27261.10	1.06	12308.94	13343.58	1607.52	1606.31	1.21	1.30	0.51	13370.93	13373.02
3.41	89	44010.05	1.06	12308.43	28927.37	2773.19	2768.22	4.97	4.24	0.99	30120.36	30118.72

85 2042 R PP 51 18 40.324 129 6 45.244

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.19	83	13890.68	1.06	12309.90	0.00	1579.72	1577.55	2.17	2.70			
3.14	73	27261.10	1.06	12308.94	13343.58	1607.52	1605.62	1.90	1.30	0.51	13370.93	13371.65
3.41	89	44010.05	1.06	12308.43	28927.37	2773.19	2769.16	4.03	4.24	0.99	30120.36	30118.98

86 142 FF 51 29 14.523 130 14 4.786

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.21	85	14135.92	1.11	12309.90	0.00	1824.91	1822.90	2.01	2.68			
3.10	71	27139.60	1.11	12308.94	13343.58	1485.97	1485.54	.43	.45	0.51	13004.19	13006.22
2.42	99	44259.33	1.11	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

86 2 0 GG 51 29 34.806 130 17 41.319

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.C.
3.20	84	14149.77	1.12	12309.90	0.00	1838.75	1836.37	2.38	2.67			
3.13	71	27135.46	1.12	12308.94	13343.58	1481.82	1481.50	.32	.46	0.51	12986.20	12988.71
2.42	100	44272.94	1.12	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

86 2 0 R GG 51 29 34.746 130 17 40.719

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.20	84	14149.77	1.12	12309.90	0.00	1838.75	1836.34	2.41	2.67			
3.13	71	27135.46	1.12	12308.94	13343.58	1481.82	1481.51	.31	.46	0.51	12986.20	12988.75
2.42	100	44272.94	1.12	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

86 248 FF 51 30 56.596 130 28 23.958

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.24	85	14188.55	1.13	12309.90	0.00	1877.52	1876.07	1.45	2.63			
3.05	70	27121.59	1.13	12308.94	13343.58	1467.94	1467.96	-.02	.49	0.51	12933.55	12935.47
2.41	99	44312.87	1.13	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

86 324 FF 51 32 22.642 130 36 3.422

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.25	85	14217.41	1.13	12309.90	0.00	1906.38	1904.09	2.29	2.58			
3.10	70	27109.67	1.13	12308.94	13343.58	1456.02	1456.08	-.06	.44	0.51	12892.77	12895.57
2.41	100	44343.38	1.13	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

86 434 FF 51 34 53.675 130 50 47.012

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.23	85	14272.09	1.15	12309.90	0.00	1961.04	1958.29	2.75	2.60			
3.12	70	27090.10	1.15	12308.94	13343.58	1436.43	1436.13	.30	.48	0.51	12818.52	12821.42
3.41	95	44411.55	1.15	12308.43	28927.37	3174.60	3169.31	5.29	4.13	0.99	30140.45	30138.39

8E 520 FF 51 36 19.004 131 0 47.412

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.25	85	14308.97	1.15	12309.90	0.00	1997.92	1995.44	2.48	2.58			
3.10	69	27080.12	1.15	12308.94	13343.58	1426.45	1425.50	.95	.62	0.51	12771.66	12773.64
3.44	95	44449.40	1.15	12308.43	28927.37	3212.45	3207.63	4.82	4.10	0.99	30141.42	30139.56

8E 520 R FF 51 36 19.125 131 0 57.491

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.25	85	14308.97	1.15	12309.90	0.00	1997.92	1996.08	1.84	2.58			
3.10	69	27080.12	1.15	12308.94	13343.58	1426.45	1425.47	.98	.62	0.51	12771.66	12772.97
3.44	95	44449.40	1.15	12308.43	28927.37	3212.45	3208.21	4.24	4.10	0.99	30141.42	30139.50

8E 620 BB 51 40 37.595 130 50 59.178

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.27	84	14267.77	1.17	12309.90	0.00	1956.70	1954.75	1.95	2.59			
3.10	69	27055.14	1.17	12308.94	13343.58	1401.45	1400.66	.79	.47	0.51	12787.88	12789.49
3.45	94	44427.89	1.17	12308.43	28927.37	3190.92	3186.59	4.33	4.06	0.99	30161.11	30159.21

8E 656 GG 51 43 53.007 130 44 .621

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.29	84	14231.04	1.17	12309.90	0.00	0.00	0.00	0.00	0.00			
3.12	69	27037.04	1.17	12308.94	13343.58	1383.35	1382.44	.91	.46	0.51	0.00	0.00
3.46	93	44407.14	1.17	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

8E 656 R GG 51 43 54.086 130 41 59.665

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.29	84	14231.04	1.17	12309.90	0.00	1919.97	1918.18	1.79	2.64			
3.12	69	27037.04	1.17	12308.94	13343.58	1383.35	1382.97	.38	.46	0.51	12806.51	12808.37
3.46	93	44407.14	1.17	12308.43	28927.37	3170.17	3165.88	4.29	4.20	0.99	30177.09	30175.07

8E 928 R FF 51 59 14.389 130 5 50.989

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.29	84	14085.37	1.20	12309.90	0.00	1774.27	1772.79	1.48	2.73			
3.21	70	26961.28	1.20	12308.94	13343.58	1307.56	1307.61	-.05	.66	0.51	12876.42	12878.40
3.39	89	44335.03	1.20	12308.43	28927.37	3098.03	3094.66	3.37	2.97	0.99	30250.65	30249.24

8E 1114 FF 52 7 54.083 129 40 44.351

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.30	82	13988.67	1.22	12309.90	0.00	1677.55	1675.31	2.24	2.78			
3.14	70	26931.70	1.22	12308.94	13343.58	1277.96	1276.78	1.18	1.00	0.51	12943.54	12945.05
3.41	90	44284.82	1.22	12308.43	28927.37	3047.80	3043.79	4.01	3.56	0.99	30297.14	30295.85

8E 1218 FF 52 12 8.888 129 25 20.307

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.27	82	13929.90	1.23	12309.90	0.00	1618.77	1616.56	2.21	2.90			
3.21	72	26923.37	1.23	12308.94	13343.58	1269.62	1268.16	1.46	1.43	0.51	12993.98	12995.18
3.45	92	44252.07	1.23	12308.43	28927.37	3015.04	3010.72	4.32	3.76	0.99	30323.16	30321.53

8E 1218 R FF 52 12 9.608 129 25 29.067

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.27	82	13929.90	1.23	12309.90	0.00	1618.77	1617.12	1.65	2.90			
3.21	72	26923.37	1.23	12308.94	13343.58	1269.62	1267.92	1.70	1.43	0.51	12993.98	12994.38
3.45	92	44252.07	1.23	12308.43	28927.37	3015.04	3011.21	3.83	3.76	0.99	30323.16	30321.46

8E 1350 FF 52 17 45.911 129 29 41.766

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.29	84	13947.17	1.25	12309.90	0.00	1636.02	1633.67	2.35	2.69			
3.24	73	26884.71	1.25	12308.94	13343.58	1230.94	1229.99	.95	1.45	0.51	12938.05	12939.30
3.45	94	44286.32	1.25	12308.43	28927.37	3049.27	3044.44	4.83	4.17	0.99	30340.14	30338.14

8E 14 6 FF 52 19 1.573 129 33 11.577

CYCLE	GAIN	OBS TCA	CLCOK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TCA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.28	83	13960.46	1.25	12309.90	0.00	1649.31	1647.15	2.16	2.81			
3.25	72	26874.49	1.25	12308.94	13343.58	1220.72	1218.58	2.14	1.30	0.51	12914.54	12915.01
3.44	95	44300.81	1.25	12308.43	28927.37	3063.76	3059.78	3.98	4.16	0.99	30341.34	30340.00

8E 14 6 R FF 52 18 53.593 129 33 5.097

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OPS T.C.	CALC T.D.
3.28	83	13960.46	1.25	12309.90	0.00	1649.31	1646.72	2.59	2.81			
3.25	72	26874.49	1.25	12308.94	13343.58	1220.72	1219.49	1.23	1.30	0.51	12914.54	12916.35
3.44	95	44300.81	1.25	12308.43	28927.37	3063.76	3058.97	4.79	4.16	0.99	30341.34	30339.62

8E 1454 FF 52 21 41.062 129 42 48.994

CYCLE	GAIN	OPS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TCA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.C.
3.28	83	13998.12	1.26	12309.90	0.00	1686.96	1684.17	2.79	2.82			
3.15	70	26847.43	1.26	12308.94	13343.58	1193.65	1192.43	1.22	1.13	0.51	12849.82	12851.84
3.46	94	44340.82	1.26	12308.43	28927.37	3103.76	3099.04	4.72	3.99	0.99	30343.69	30342.24

8E 1534 GB INT 52 23 13.469 129 51 9.975

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.25	83	14030.18	1.27	12309.90	0.00	1719.01	1716.15	2.86	2.87			
3.13	68	26829.48	1.27	12308.94	13343.58	1175.69	1174.92	.77	1.05	0.51	12799.81	12802.35
3.46	94	44372.25	1.27	12308.43	28927.37	3135.18	3130.38	4.80	3.69	0.99	30343.06	30341.60

8E 16 6 GG 52 24 39.695 129 58 26.759

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.24	84	14057.22	1.28	12309.90	0.00	1746.04	1744.06	1.98	2.82			
3.12	68	26814.39	1.28	12308.94	13343.58	1160.59	1159.60	.99	.95	0.51	12757.68	12759.12
3.45	94	44399.09	1.28	12308.43	28927.37	3162.01	3158.07	3.94	3.64	0.99	30342.86	30341.38

8E 16 6 R GG 52 24 39.335 129 58 24.119

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.24	84	14057.22	1.28	12309.90	0.00	1746.04	1743.89	2.15	2.82			
3.12	68	26814.39	1.28	12308.94	13343.58	1160.59	1159.67	.92	.95	0.51	12757.68	12759.36
3.45	94	44399.09	1.28	12308.43	28927.37	3162.01	3157.91	4.10	3.64	0.99	30342.86	30341.39

8E 1640 GG 52 26 20.861 130 5 46.303

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.25	84	14085.69	1.28	12309.90	0.00	1774.51	1772.23	2.28	2.76			
3.12	69	26797.25	1.28	12308.94	13343.58	1143.45	1143.23	.22	.85	0.51	12712.07	12714.58
3.42	94	44428.36	1.28	12308.43	28927.37	3191.28	3186.81	4.47	3.47	0.99	30343.66	30341.95

8E 1750 R FF 52 30 24.115 130 22 1.865

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.25	84	14148.39	1.30	12309.90	0.00	1837.19	1834.88	2.31	2.86			
3.19	68	26760.79	1.30	12308.94	13343.58	1106.97	1106.79	.18	.45	0.51	12612.91	12615.49
3.39	92	44493.12	1.30	12308.43	28927.37	3256.02	3251.71	4.31	3.46	0.99	30345.72	30344.20

8E 1936 PR INT 52 36 37.038 130 49 6.903

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.33	85	14252.90	1.32	12309.90	0.00	1941.68	1939.21	2.47	2.80			
3.20	67	26708.55	1.32	12308.94	13343.58	1054.71	1055.46	-.75	.45	0.51	12456.16	12459.83
3.46	92	44599.95	1.32	12308.43	28927.37	3362.83	3358.06	4.77	3.41	0.99	30348.04	30346.22

8E 2132 GG 52 44 38.124 130 57 46.948

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.34	86	14288.93	1.34	12309.90	0.00	1977.69	1975.51	2.18	2.94			
3.18	64	26657.42	1.34	12308.94	13343.58	1003.56	1003.53	.03	.48	0.51	12369.00	12371.60
3.50	93	44654.07	1.34	12308.43	28927.37	3416.93	3412.70	4.23	3.42	0.99	30366.13	30364.56

87 158 GG 52 57 48.515 130 10 1.336

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.42	86	14120.68	1.39	12309.90	0.00	1809.39	1807.41	1.98	3.16			
3.23	65	26605.07	1.39	12308.94	13343.58	951.16	949.89	1.27	1.10	0.51	12484.90	12486.06
3.67	100	44555.40	1.39	12308.43	28927.37	3318.21	3314.11	4.10	4.60	0.99	30435.71	30434.07

87 220 PP 52 58 49.000 130 15 22.324

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.42	86	14141.45	1.39	12309.90	0.00	1830.16	1828.13	2.03	3.16			
3.25	66	26594.07	1.39	12308.94	13343.58	940.16	939.16	1.00	1.02	0.51	12453.13	12454.61
3.67	100	44575.17	1.39	12308.43	28927.37	3337.98	3333.83	4.15	4.52	0.99	30434.71	30433.07

87 238 GG INT 52 59 41.023 130 19 45.415

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.41	86	14158.69	1.40	12309.90	0.00	1847.39	1845.13	2.26	3.02			
3.29	66	26584.87	1.40	12308.94	13343.58	930.95	930.35	.60	.74	0.51	12426.69	12428.80
3.61	99	44591.79	1.40	12308.43	28927.37	3354.59	3350.15	4.44	4.51	0.99	30434.09	30432.39

87 258 FF 53 0 42.587 130 24 26.444

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.42	86	14177.40	1.40	12309.90	0.00	1866.10	1863.40	2.70	2.99			
3.34	66	26574.78	1.40	12308.94	13343.58	920.86	920.60	.26	.71	0.51	12397.89	12400.78
3.57	99	44610.02	1.40	12308.43	28927.37	3372.82	3367.97	4.85	4.42	0.99	30433.61	30431.94

87 258 R FF 53 0 41.627 130 24 22.604

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.42	86	14177.40	1.40	12309.90	0.00	1866.10	1863.15	2.95	2.99			
3.34	66	26574.78	1.40	12308.94	13343.58	920.86	920.74	.12	.71	0.51	12397.89	12401.17
3.57	99	44610.02	1.40	12308.43	28927.37	3372.82	3367.72	5.10	4.42	0.99	30433.61	30431.94

87 4 2 FF 53 3 40.681 130 39 49.930

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.41	86	14238.09	1.41	12309.90	0.00	1926.78	1923.00	3.78	3.09			
3.30	65	26546.85	1.41	12308.94	13343.58	892.92	892.87	.05	.47	0.51	12309.27	12313.45
3.58	99	44667.91	1.41	12308.43	28927.37	3430.70	3425.12	5.58	4.34	0.99	30430.81	30429.49

87 4 2 R FF 53 3 40.501 130 40 14.769

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.41	86	14238.09	1.41	12309.90	0.00	1926.78	1924.52	2.26	3.09			
3.30	65	26546.85	1.41	12308.94	13343.58	892.92	892.68	.24	.47	0.51	12309.27	12311.74
3.58	99	44667.91	1.41	12308.43	28927.37	3430.70	3426.35	4.35	4.34	0.99	30430.81	30429.20

87 424 GG 53 4 34.986 130 45 38.277

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TCA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.42	86	14259.50	1.42	12309.90	0.00	1948.18	1945.26	2.92	3.12			
3.25	65	26538.44	1.42	12308.94	13343.58	884.50	884.52	-.02	.51	0.51	12279.45	12282.84
3.58	99	44688.11	1.42	12308.43	28927.37	3450.89	3445.92	4.97	4.30	0.99	30429.60	30428.03

87 532 FF 53 7 45.501 131 3 2.299

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.42	86	14326.97	1.43	12309.90	0.00	2015.64	2012.37	3.27	3.10			
3.24	63	26513.35	1.43	12308.94	13343.58	859.40	859.48	-.08	.53	0.51	12186.89	12190.69
3.58	99	44752.58	1.43	12308.43	28927.37	3515.35	3510.08	5.27	4.23	0.99	30426.60	30425.08

87 614 BB INT 53 9 37.890 131 13 28.676

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.40	86	14367.26	1.44	12309.90	0.00	2055.92	2052.57	3.35	3.09			
3.26	64	26500.89	1.44	12308.94	13343.58	846.93	846.77	.16	.45	0.51	12134.14	12137.78
3.59	98	44791.04	1.44	12308.43	28927.37	3553.80	3548.53	5.27	4.15	0.99	30424.77	30423.33

87 738 BR INT 53 17 1.284 131 10 11.803

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.39	87	14361.49	1.45	12309.90	0.00	2050.14	2048.19	1.95	3.17			
3.23	62	26454.40	1.45	12308.94	13343.58	800.43	801.20	-.77	.44	0.51	12093.42	12096.59
3.57	99	44806.86	1.45	12308.43	28927.37	3569.61	3565.11	4.50	4.30	0.99	30446.36	30444.29

87 832 FF 53 21 51.550 130 57 12.772

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.40	87	14319.84	1.46	12309.90	0.00	2008.48	2006.59	1.89	3.33			
3.24	62	26427.71	1.46	12308.94	13343.58	773.73	773.77	-.04	.46	0.51	12108.38	12110.76
3.57	101	44785.62	1.46	12308.43	28927.37	3548.36	3544.02	4.34	4.54	0.99	30466.77	30464.80

87 832 R FF 53 22 8.529 130 56 22.373

CYCLE	GAIN	OPS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.40	87	14319.84	1.46	12309.90	0.00	2008.48	2003.89	4.59	3.33			
3.24	62	26427.71	1.46	12308.94	13343.58	773.73	772.29	1.44	.46	0.51	12108.38	12111.98
3.57	101	44785.62	1.46	12308.43	28927.37	3548.36	3542.58	5.78	4.54	0.99	30466.77	30466.06

87 1018 FP 53 37 33.719 130 52 13.579

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.41	90	14325.53	1.48	12309.90	0.00	2014.15	2010.49	3.66	3.64			
3.30	63	26333.51	1.48	12308.94	13343.58	679.51	678.87	.64	.51	0.51	12008.49	12011.96
3.60	106	44831.26	1.48	12308.43	28927.37	3593.98	3588.66	5.32	5.13	0.99	30506.72	30505.54

87 1132 GG 53 50 1.437 130 55 39.219

CYCLE	GAIN	OPS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OPS T.D.	CALC T.D.
3.43	91	14357.14	1.50	12309.90	0.00	2045.74	2043.13	2.61	3.67			
3.31	61	26255.36	1.50	12308.94	13343.58	601.34	600.75	.59	.52	0.51	11898.73	11901.20
3.61	108	44889.25	1.50	12308.43	28927.37	3651.95	3646.70	5.25	5.68	0.99	30533.10	30530.94

87 1132 R GG 53 49 59.097 130 55 37.779

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.43	91	14357.14	1.50	12309.90	0.00	2045.74	2042.98	2.76	3.67			
3.31	61	26255.36	1.50	12308.94	13343.58	601.34	601.00	.34	.52	0.51	11898.73	11901.60
3.61	108	44889.25	1.50	12308.43	28927.37	3651.95	3646.48	5.47	5.68	0.99	30533.10	30530.87

87 14 8 GG 54 15 53.513 131 4 5.293

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.45	90	14437.85	1.53	12309.90	0.00	2126.42	2122.61	3.81	3.62			
3.36	57	26093.25	1.53	12308.94	13343.58	439.20	438.25	.95	.53	0.51	11655.91	11659.22
3.62	116	45016.25	1.53	12308.43	28927.37	3778.92	3772.84	6.08	6.00	0.99	30579.39	30577.60

87 14 8 R GG 54 15 54.053 131 4 7.573

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.45	90	14437.85	1.53	12309.90	0.00	2126.42	2122.76	3.66	3.62			
3.36	57	26093.25	1.53	12308.94	13343.58	439.20	438.18	1.02	.53	0.51	11655.91	11659.00
3.62	116	45016.25	1.53	12308.43	28927.37	3778.92	3772.98	5.94	6.00	0.99	30579.39	30577.59

87 1444 GG 54 18 57.179 131 12 14.270

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.46	91	14471.09	1.53	12309.90	0.00	2159.66	2156.89	2.77	3.50			
3.29	57	26071.94	1.53	12308.94	13343.58	417.89	417.63	.26	.55	0.51	11601.36	11604.32
3.71	116	45050.94	1.53	12308.43	28927.37	3813.61	3807.63	5.98	5.94	0.99	30580.84	30578.11

87 15 6 FF 54 21 8.942 131 16 46.356

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.C.
3.49	91	14491.20	1.54	12309.90	0.00	2179.76	2177.00	2.76	3.49			
3.29	56	26058.72	1.54	12308.94	13343.58	404.66	403.93	.73	.64	0.51	11568.03	11570.51
3.67	114	45071.96	1.54	12308.43	28927.37	3834.62	3828.94	5.68	5.90	0.99	30581.75	30579.31

87 15 6 R FF 54 21 4.442 131 16 34.836

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.49	91	14491.20	1.54	12309.90	0.00	2179.76	2176.19	3.57	3.49			
3.29	56	26058.72	1.54	12308.94	13343.58	404.66	404.38	.28	.64	0.51	11568.03	11571.77
3.67	114	45071.96	1.54	12308.43	28927.37	3834.62	3828.11	6.51	5.90	0.99	30581.75	30579.29

87 15 6 R FF 54 21 3.782 131 16 39.576

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.49	91	14491.20	1.54	12309.90	0.00	2179.76	2176.43	3.33	3.49			
3.29	56	26058.72	1.54	12308.94	13343.58	404.66	404.45	.21	.64	0.51	11568.03	11571.60
3.67	114	45071.96	1.54	12308.43	28927.37	3834.62	3828.28	6.34	5.90	0.99	30581.75	30579.22

87 1552 FP 54 26 1.269 131 26 .486

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.49	90	14534.91	1.55	12309.90	0.00	2223.46	2218.85	4.61	3.53			
3.35	56	26030.29	1.55	12308.94	13343.58	376.22	375.69	.53	.55	0.51	11495.89	11500.42
3.62	113	45118.48	1.55	12308.43	28927.37	3881.13	3873.92	7.21	5.83	0.99	30584.56	30582.44

87 1630 GG 54 30 3.196 131 35 11.978

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.49	90	14573.14	1.55	12309.90	0.00	2261.69	2258.73	2.96	3.50			
3.39	55	26010.56	1.55	12308.94	13343.58	356.49	355.95	.54	.65	0.51	11437.93	11440.80
3.60	113	45158.49	1.55	12308.43	28927.37	3921.14	3915.38	5.76	5.77	0.99	30586.34	30584.02

87 1740 GG 54 28 18.913 131 31 49.189

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.47	90	14557.48	1.57	12309.90	0.00	2246.01	2243.50	2.51	3.46			
3.55	112	26023.31	1.57	12308.94	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
3.63	113	45141.71	1.57	12308.43	28927.37	3904.34	3899.12	5.22	5.79	0.99	30585.22	30582.99

87 1740 R GG 54 28 16.633 131 31 44.869

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.47	90	14557.48	1.57	12309.90	0.00	2246.01	2243.17	2.84	3.46			
3.55	112	26023.31	1.57	12308.94	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
3.63	113	45141.71	1.57	12308.43	28927.37	3904.34	3898.77	5.57	5.79	0.99	30585.22	30582.97

87 1820 BB 54 23 58.686 131 22 21.858

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.55	90	14516.55	1.58	12309.90	0.00	2205.07	2202.07	3.00	3.54			
4.03	61	26039.07	1.58	12308.94	13343.58	0.00	0.00	0.00	0.00	0.51	0.00	0.00
3.71	114	45099.27	1.58	12308.43	28927.37	3861.89	3855.69	6.20	5.85	0.99	30583.71	30580.99

87 1830 FF 54 23 6.424 131 20 .505

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.56	90	14506.28	1.58	12309.90	0.00	2194.80	2192.20	2.60	3.56			
3.30	59	26047.07	1.58	12308.94	13343.58	392.97	392.13	.84	.56	0.51	11541.30	11543.51
3.72	115	45088.39	1.58	12308.43	28927.37	3851.01	3845.71	5.30	5.87	0.99	30583.10	30580.88

87 2040 GG 54 21 30.300 131 14 9.699

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.59	91	14483.23	1.60	12309.90	0.00	2171.73	2168.93	2.80	3.54			
3.26	59	26056.04	1.60	12308.94	13343.58	401.92	401.70	.22	.54	0.51	11573.32	11576.35
3.95	115	45066.34	1.60	12308.43	28927.37	3828.94	3823.17	5.77	5.91	0.99	30584.10	30581.61

87 2040 R GG 54 21 26.880 131 14 12.219

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.59	91	14483.23	1.60	12309.90	0.00	2171.73	2168.94	2.79	3.54			
3.26	59	26056.04	1.60	12308.94	13343.58	401.92	402.06	-.14	.54	0.51	11573.32	11576.70
3.95	115	45066.34	1.60	12308.43	28927.37	3828.94	3823.06	5.88	5.91	0.99	30584.10	30581.49

87 2224 FR 54 31 21.198 131 38 5.549

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.59	91	14585.64	1.62	12309.90	0.00	2274.12	2271.34	2.78	3.52			
3.35	59	26005.07	1.62	12308.94	13343.58	350.93	350.31	.62	.79	0.51	11419.94	11422.55
3.93	114	45171.46	1.62	12308.43	28927.37	3934.04	3928.54	5.50	5.75	0.99	30586.81	30584.57

87 2224 R FR 54 31 21.138 131 38 7.409

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.59	91	14585.64	1.62	12309.90	0.00	2274.12	2271.44	2.68	3.52			
3.35	59	26005.07	1.62	12308.94	13343.58	350.93	350.34	.59	.79	0.51	11419.94	11422.48
3.93	114	45171.46	1.62	12308.43	28927.37	3934.04	3928.63	5.41	5.75	0.99	30586.81	30584.56

88 012 GG 54 34 3.104 132 6 44.312

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.56	92	14688.47	1.64	12309.90	0.00	2376.93	2373.83	3.10	3.43			
3.38	56	26027.19	1.64	12308.94	13343.58	373.03	372.30	.73	.94	0.51	11339.23	11342.05
3.96	113	45261.77	1.64	12308.43	28927.37	4024.33	4018.89	5.44	5.45	0.99	30574.29	30572.43

88 012 R GG 54 34 1.484 132 6 52.232

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.56	92	14688.47	1.64	12309.90	0.00	2376.93	2374.22	2.71	3.43			
3.38	56	26027.19	1.64	12308.94	13343.58	373.03	372.68	.35	.94	0.51	11339.23	11342.04
3.96	113	45261.77	1.64	12308.43	28927.37	4024.33	4019.16	5.17	5.45	0.99	30574.29	30572.31

88 146 GG 54 34 5.650 132 32 43.787

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.61	91	14776.85	1.66	12309.90	0.00	2465.29	2462.11	3.18	3.38			
3.39	58	26080.57	1.66	12308.94	13343.58	426.39	425.36	1.03	1.16	0.51	11304.23	11306.83
4.03	111	45335.54	1.66	12308.43	28927.37	4098.08	4092.54	5.54	5.23	0.99	30559.68	30557.80

88 146 R GG 54 34 9.910 132 32 46.427

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.61	91	14776.85	1.66	12309.90	0.00	2465.29	2462.40	2.89	3.38			
3.39	58	26080.57	1.66	12308.94	13343.58	426.39	425.12	1.27	1.16	0.51	11304.23	11306.30
4.03	111	45335.54	1.66	12308.43	28927.37	4098.08	4092.93	5.15	5.23	0.99	30559.68	30557.90

88 2 8 GG 54 34 11.116 132 38 47.196

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	FMISSION DFLAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.G.
3.63	91	14797.42	1.66	12309.90	0.00	2485.86	2482.93	2.93	3.44			
3.35	58	26094.42	1.66	12308.94	13343.58	440.24	439.24	1.00	.95	0.51	11297.51	11299.89
4.09	110	45352.98	1.66	12308.43	28927.37	4115.52	4110.18	5.34	5.19	0.99	30556.55	30554.62

88 2 8 R GG 54 34 13.456 132 38 54.336

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.63	91	14797.42	1.66	12309.90	0.00	2485.86	2483.41	2.45	3.44			
3.35	58	26094.42	1.66	12308.94	13343.58	440.24	439.34	.90	.95	0.51	11297.51	11299.51
4.09	110	45352.98	1.66	12308.43	28927.37	4115.52	4110.66	4.86	5.19	0.99	30556.55	30554.62

88 3 0 FF 54 33 38.250 132 52 43.574

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.65	91	14844.75	1.67	12309.90	0.00	2533.18	2529.47	3.71	3.41			
3.42	59	26131.87	1.67	12308.94	13343.58	477.68	476.59	1.09	.79	0.51	11287.63	11290.70
4.22	109	45391.40	1.67	12308.43	28927.37	4153.93	4148.16	5.77	4.90	0.99	30547.64	30546.06

88 332 FP 54 33 20.978 133 1 27.360

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.64	92	14873.83	1.68	12309.90	0.00	2562.25	2558.83	3.42	3.39			
3.40	62	26156.64	1.68	12308.94	13343.58	502.44	500.86	1.58	.75	0.51	11283.32	11285.61
4.16	109	45415.11	1.68	12308.43	28927.37	4177.63	4172.34	5.29	4.78	0.99	30542.27	30540.88

88 356 PP INT 54 33 32.085 133 8 13.308

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.64	91	14897.13	1.68	12309.90	0.00	2585.55	2582.40	3.15	3.37			
3.44	62	26174.69	1.68	12308.94	13343.58	520.49	518.56	1.93	1.02	0.51	11278.07	11279.74
4.05	109	45435.03	1.68	12308.43	28927.37	4197.55	4192.68	4.87	4.78	0.99	30538.89	30537.65

88 520 GG 54 33 57.488 133 31 2.708

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.C.
3.64	92	14976.19	1.70	12309.90	0.00	2664.59	2661.69	2.90	3.30			
3.36	64	26238.42	1.70	12308.94	13343.58	584.20	582.34	1.86	1.26	0.51	11262.74	11264.23
3.89	107	45503.25	1.70	12308.43	28927.37	4265.75	4260.98	4.77	4.79	0.99	30528.05	30526.66

88 520 R GG 54 33 56.168 133 31 11.168

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.64	92	14976.19	1.70	12309.90	0.00	2664.59	2662.14	2.45	3.30			
3.36	64	26238.42	1.70	12308.94	13343.58	584.20	582.84	1.36	1.26	0.51	11262.74	11264.28
3.89	107	45503.25	1.70	12308.43	28927.37	4265.75	4261.32	4.43	4.79	0.99	30528.05	30526.55

88 924 R GG 54 27 24.832 133 12 32.459

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.62	92	14900.35	1.75	12309.90	0.00	2588.70	2586.18	2.52	3.35			
3.39	62	26209.97	1.75	12308.94	13343.58	555.70	555.14	.56	.70	0.51	11310.13	11312.54
3.79	106	45425.45	1.75	12308.43	28927.37	4187.90	4183.12	4.78	4.98	0.99	30526.09	30524.31

88 1110 GG 54 27 50.603 132 42 33.828

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.61	91	14798.42	1.77	12309.90	0.00	2486.75	2483.58	3.17	3.43			
3.36	59	26133.15	1.77	12308.94	13343.58	478.86	477.78	1.08	1.09	0.51	11335.24	11337.78
3.80	108	45340.33	1.77	12308.43	28927.37	4102.76	4097.33	5.43	4.78	0.99	30542.90	30541.12

88 1110 R GG 54 27 52.523 132 42 33.038

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.61	91	14798.42	1.77	12309.90	0.00	2486.75	2483.59	3.16	3.43			
3.36	59	26133.15	1.77	12308.94	13343.58	478.86	477.60	1.26	1.09	0.51	11335.24	11337.59
3.80	108	45340.33	1.77	12308.43	28927.37	4102.76	4097.41	5.35	4.78	0.99	30542.90	30541.19

88 1228 GG 54 28 5.518 132 17 47.670

CYCLE	GAIN	OPS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OPS T.C.	CALC T.D.
3.62	91	14713.65	1.78	12309.90	0.00	2401.97	2399.17	2.80	3.52			
3.36	57	26079.64	1.78	12308.94	13343.58	425.34	424.25	1.09	.87	0.51	11366.50	11368.66
3.81	110	45269.96	1.78	12308.43	28927.37	4032.38	4027.22	5.16	5.19	0.99	30557.30	30555.42

88 1228 R GG 54 28 5.638 132 17 51.150

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.62	91	14713.65	1.78	12309.90	0.00	2401.97	2399.37	2.60	3.52			
3.36	57	26079.64	1.78	12308.94	13343.58	425.34	424.35	.99	.87	0.51	11366.50	11368.56
3.81	110	45269.96	1.78	12308.43	28927.37	4032.38	4027.39	4.99	5.19	0.99	30557.30	30555.39

88 15 4 FF 54 6 44.524 132 13 16.059

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DFLAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.C.
3.69	91	14659.26	1.81	12309.90	0.00	2347.55	2344.15	3.40	3.63			
3.34	60	26190.71	1.81	12308.94	13343.58	536.38	535.10	1.28	.81	0.51	11531.96	11534.53
4.02	106	45177.25	1.81	12308.43	28927.37	3939.64	3934.09	5.55	5.04	0.99	30518.98	30517.31

89 2034 FF 54 19 14.082 132 58 30.226

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.C.
3.64	92	14837.85	2.15	12309.90	0.00	2525.80	2523.29	2.51	3.35			
3.38	60	26210.30	2.15	12308.94	13343.58	555.63	555.74	-.11	.98	0.51	11372.96	11376.03
3.82	105	45355.38	2.15	12308.43	28927.37	4117.43	4112.38	5.05	4.96	0.99	30518.52	30516.46

89 2218 R GP 54 9 55.150 133 22 6.333

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.64	91	14906.80	2.17	12309.90	0.00	2594.73	2591.18	3.55	3.98			
3.37	62	26311.46	2.17	12308.94	13343.58	656.77	655.87	.90	.81	0.51	11405.17	11408.27
3.81	104	45393.53	2.17	12308.43	28927.37	4155.56	4149.93	5.63	4.81	0.99	30487.72	30486.12

90 0 6 GG 53 51 54.379 133 22 52.643

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.53	92	14884.74	2.19	12309.90	0.00	2572.65	2569.42	3.23	3.60			
3.39	112	26399.80	2.19	12308.94	13343.58	745.09	743.14	1.95	1.02	0.51	11515.57	11517.30
3.84	103	45334.47	2.19	12308.43	28927.37	4096.48	4091.14	5.34	4.44	0.99	30450.72	30449.09

90 0 6 R GG 53 51 54.919 133 22 50.544

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.53	92	14884.74	2.19	12309.90	0.00	2572.65	2569.31	3.34	3.60			
3.39	112	26399.80	2.19	12308.94	13343.58	745.09	743.02	2.07	1.02	0.51	11515.57	11517.29
3.84	103	45334.47	2.19	12308.43	28927.37	4096.48	4091.06	5.42	4.44	0.99	30450.72	30449.12

90 030 GG 53 48 5.360 133 22 1.536

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.53	92	14876.60	2.19	12309.90	0.00	2564.51	2561.77	2.74	3.60			
3.69	70	26415.69	2.19	12308.94	13343.58	760.98	760.27	.71	1.05	0.51	11539.60	11542.08
3.82	102	45318.96	2.19	12308.43	28927.37	4080.97	4075.82	5.15	4.26	0.99	30443.35	30441.42

90 030 R GG 53 48 6.800 133 21 54.876

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.53	92	14876.60	2.19	12309.90	0.00	2564.51	2561.39	3.12	3.60			
3.69	70	26415.69	2.19	12308.94	13343.58	760.98	759.91	1.07	1.05	0.51	11539.60	11542.10
3.82	102	45318.96	2.19	12308.43	28927.37	4080.97	4075.56	5.41	4.26	0.99	30443.35	30441.54

9C 118 BB INT 53 40 .199 133 18 6.605

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.55	0	14853.22	2.20	12309.90	0.00	2541.12	2538.51	2.61	3.57			
3.39	0	26448.64	2.20	12308.94	13343.58	793.92	793.39	.53	1.28	0.51	11595.93	11598.46
3.82	0	45279.80	2.20	12308.43	28927.37	4041.80	4037.01	4.79	3.89	0.99	30427.57	30425.87

9C 150 FF 53 34 32.899 133 15 36.864

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.57	91	14838.83	2.21	12309.90	0.00	2526.72	2523.79	2.93	3.58			
3.40	64	26472.77	2.21	12308.94	13343.58	818.04	817.10	.94	1.27	0.51	11634.45	11636.89
3.91	101	45253.98	2.21	12308.43	28927.37	4015.97	4011.42	4.55	3.93	0.99	30416.14	30415.00

9C 150 R FF 53 34 34.519 133 15 27.744

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.57	91	14838.83	2.21	12309.90	0.00	2526.72	2523.26	3.46	3.58			
3.40	64	26472.77	2.21	12308.94	13343.58	818.04	816.66	1.38	1.27	0.51	11634.45	11636.98
3.91	101	45253.98	2.21	12308.43	28927.37	4015.97	4011.03	4.94	3.93	0.99	30416.14	30415.14

9C 218 BB INT 53 29 46.158 133 12 27.283

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.55	91	14823.50	2.21	12309.90	0.00	2511.39	2507.64	3.75	3.37			
3.44	65	26492.83	2.21	12308.94	13343.58	838.10	836.73	1.37	1.29	0.51	11669.84	11672.67
3.91	101	45229.96	2.21	12308.43	28927.37	3991.95	3986.02	5.93	3.93	0.99	30407.45	30405.75

9C 232 FF 53 27 35.357 133 10 34.972

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.58	92	14813.89	2.22	12309.90	0.00	2501.77	2498.77	3.00	3.30			
3.48	64	26501.36	2.22	12308.94	13343.58	846.62	845.14	1.48	1.31	0.51	11687.98	11689.95
3.99	102	45216.10	2.22	12308.43	28927.37	3978.08	3973.09	4.99	3.96	0.99	30403.20	30401.69

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 90  232 R    FF                   53 27 37.997   133 10 45.411
             OBS    CLOCK    CLOCK  EMISSION   CORR     CALC    OBS   CALC MON.      OBS       CALC
CYCLE GAIN   TOA     RATE    SYNCH     DELAY    TOA      TOA    ASF    ASF CORR    T.D.       T.D.
 3.58   92 14813.89   2.22 12309.90      0.00 2501.77  2499.45 2.32 3.30
 3.48   64 26501.36   2.22 12308.94 13343.58   846.62   845.21 1.41 1.31 0.51 11687.98 11689.34
 3.99  102 45216.10   2.22 12308.43 28927.37 3978.08  3973.78 4.30 3.96 0.99 30403.20 30401.70

 90  412      GG                   53 11 53.828   132 56  1.318
             OBS    CLOCK    CLOCK  EMISSION   CORR     CALC    OBS   CALC MON.      OBS       CALC
CYCLE GAIN   TOA     RATE    SYNCH     DELAY    TOA      TOA    ASF    ASF CORR    T.D.       T.D.
 3.64   91 14746.78   2.23 12309.90      0.00 2434.65  2432.51 2.14 3.30
 3.46   67 26565.48   2.23 12308.94 13343.58   910.73   909.13 1.60 1.61 0.51 11819.21 11820.20
 3.80   96 45118.73   2.23 12308.43 28927.37 3880.70  3876.79 3.91 3.43 0.99 30372.94 30371.65

 90  452      GG                   53  5 52.865   132 50 15.264
             OBS    CLOCK    CLOCK  EMISSION   CORR     CALC    OBS   CALC MON.      OBS       CALC
CYCLE GAIN   TOA     RATE    SYNCH     DELAY    TOA      TOA    ASF    ASF CORR    T.D.       T.D.
 3.64   91 14722.37   2.24 12309.90      0.00 2410.23  2407.11 3.12 3.29
 3.39   66 26592.61   2.24 12308.94 13343.58   937.85   935.64 2.21 1.38 0.51 11870.75 11872.11
 3.79   98 45081.55   2.24 12308.43 28927.37 3843.51  3839.35 4.16 3.67 0.99 30360.17 30359.61

 90  452 R    GG                   53  5 53.105   132 50 14.184
             OBS    CLOCK    CLOCK  EMISSION   CORR     CALC    OBS   CALC MON.      OBS       CALC
CYCLE GAIN   TOA     RATE    SYNCH     DELAY    TOA      TOA    ASF    ASF CORR    T.D.       T.D.
 3.64   91 14722.37   2.24 12309.90      0.00 2410.23  2407.05 3.18 3.29
 3.39   66 26592.61   2.24 12308.94 13343.58   937.85   935.60 2.25 1.38 0.51 11870.75 11872.13
 3.79   98 45081.55   2.24 12308.43 28927.37 3843.51  3839.30 4.21 3.67 0.99 30360.17 30359.62

 90  524      GG                   53  0 54.542   132 45 44.565
             OBS    CLOCK    CLOCK  EMISSION   CORR     CALC    OBS   CALC MON.      OBS       CALC
CYCLE GAIN   TOA     RATE    SYNCH     DELAY    TOA      TOA    ASF    ASF CORR    T.D.       T.D.
 3.65   91 14702.38   2.25 12309.90      0.00 2390.23  2387.38 2.85 3.28
 3.42   67 26615.60   2.25 12308.94 13343.58   960.83   958.73 2.10 1.46 0.51 11913.73 11914.93
 3.81   98 45051.52   2.25 12308.43 28927.37 3813.47  3809.26 4.21 3.32 0.99 30350.13 30349.25
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9C 524 R GG 53 0 55.862 132 45 39.885

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.65	91	14702.38	2.25	12309.90	0.00	2390.23	2387.10	3.13	3.28			
3.42	67	26615.60	2.25	12308.94	13343.58	960.83	958.50	2.33	1.46	0.51	11913.73	11914.98
3.81	98	45051.52	2.25	12308.43	28927.37	3813.47	3809.08	4.39	3.32	0.99	30350.13	30349.35

9C 558 GG 52 56 5.098 132 40 7.867

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.67	91	14678.53	2.25	12309.90	0.00	2366.38	2363.91	2.47	3.21			
3.44	69	26637.46	2.25	12308.94	13343.58	982.69	980.36	2.33	1.58	0.51	11959.44	11960.03
3.78	97	45018.07	2.25	12308.43	28927.37	3780.02	3776.12	3.90	3.30	0.99	30340.53	30339.58

9C 558 R GG 52 56 1.378 132 39 52.268

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.67	91	14678.53	2.25	12309.90	0.00	2366.38	2362.91	3.47	3.21			
3.44	69	26637.46	2.25	12308.94	13343.58	982.69	980.43	2.26	1.58	0.51	11959.44	11961.10
3.78	97	45018.07	2.25	12308.43	28927.37	3780.02	3775.09	4.93	3.30	0.99	30340.53	30339.55

9C 924 FF 52 28 44.011 132 3 25.999

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.63	87	14531.71	2.29	12309.90	0.00	2219.52	2217.53	1.99	2.79			
3.60	72	26771.50	2.29	12308.94	13343.58	1116.69	1113.97	2.72	1.12	0.51	12240.30	12240.02
3.81	94	44813.70	2.29	12308.43	28927.37	3575.61	3572.27	3.34	3.62	0.99	30282.98	30282.11

9C 924 R FF 52 28 31.651 132 3 24.379

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.C.
3.63	87	14531.71	2.29	12309.90	0.00	2219.52	2217.40	2.12	2.79			
3.60	72	26771.50	2.29	12308.94	13343.58	1116.69	1115.22	1.47	1.12	0.51	12240.30	12241.40
3.81	94	44813.70	2.29	12308.43	28927.37	3575.61	3571.55	4.06	3.62	0.99	30282.98	30281.52

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 9C 1054      BB INT              52 16 17.119   131 46 49.518
             OBS    CLOCK    CLOCK  EMISSION   CORR     CALC   OBS   CALC MON.     OBS       CALC
CYCLE GAIN   TOA     RATE    SYNCH    DELAY    TOA      TOA    ASF    ASF CORR    T.D.       T.D.
 3.64   86 14468.91  2.31 12309.90      0.00 2156.70 2154.33 2.37 2.83
 3.52   71 26838.95  2.31 12308.94 13343.58 1184.12 1182.72 1.40  .91 0.51 12370.55 12371.97
 3.82   94 44721.86  2.31 12308.43 28927.37 3483.75 3479.74 4.01 3.85 0.99 30253.94 30252.78

 9C 11 8       FF                 52 14 23.716   131 44   .207
             OBS    CLOCK    CLOCK  EMISSION   CORR     CALC   OBS   CALC MON.     OBS       CALC
CYCLE GAIN   TOA     RATE    SYNCH    DELAY    TOA      TOA    ASF    ASF CORR    T.D.       T.D.
 3.64   86 14459.52  2.31 12309.90      0.00 2147.31 2143.78 3.53 2.84
 3.53   71 26849.36  2.31 12308.94 13343.58 1194.53 1193.42 1.11  .79 0.51 12390.35 12393.22
 3.84   94 44707.86  2.31 12308.43 28927.37 3469.75 3464.69 5.06 3.89 0.99 30249.33 30248.28

 9C 11 8 R     FF                 52 14 24.917   131 44 10.347
             OBS    CLOCK    CLOCK  EMISSION   CORR     CALC   OBS   CALC MON.     OBS       CALC
CYCLE GAIN   TOA     RATE    SYNCH    DELAY    TOA      TOA    ASF    ASF CORR    T.D.       T.D.
 3.64   86 14459.52  2.31 12309.90      0.00 2147.31 2144.42 2.89 2.84
 3.53   71 26849.36  2.31 12308.94 13343.58 1194.53 1193.35 1.18  .79 0.51 12390.35 12392.51
 3.84   94 44707.86  2.31 12308.43 28927.37 3469.75 3465.31 4.44 3.89 0.99 30249.33 30248.26

 9C 1238       GG                 52  1 55.804   131 27 18.866
             OBS    CLOCK    CLOCK  EMISSION   CORR     CALC   OBS   CALC MON.     OBS       CALC
CYCLE GAIN   TOA     RATE    SYNCH    DELAY    TOA      TOA    ASF    ASF CORR    T.D.       T.D.
 3.64   86 14398.09  2.33 12309.90      0.00 2085.86 2082.85 3.01 2.61
 3.45   70 26922.53  2.33 12308.94 13343.58 1267.68 1266.71  .97  .77 0.51 12524.95 12527.44
 3.86   95 44615.05  2.33 12308.43 28927.37 3376.92 3371.82 5.10 3.98 0.99 30217.95 30216.34

 9C 1254       PP                 51 59 54.301   131 24 13.896
             OBS    CLOCK    CLOCK  EMISSION   CORR     CALC   OBS   CALC MON.     OBS       CALC
CYCLE GAIN   TOA     RATE    SYNCH    DELAY    TOA      TOA    ASF    ASF CORR    T.D.       T.D.
 3.66   86 14386.64  2.33 12309.90      0.00 2074.41 2071.76 2.65 2.62
 3.46   70 26934.71  2.33 12308.94 13343.58 1279.86 1278.90  .96  .83 0.51 12548.58 12550.72
 3.88   94 44598.44  2.33 12308.43 28927.37 3360.31 3355.49 4.82 4.03 0.99 30212.79 30211.10
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90 1328 RR 51 55 45.536 131 17 56.936

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.69	86	14363.34	2.34	12309.90	0.00	2051.10	2049.37	1.73	2.60			
3.55	70	26959.73	2.34	12308.94	13343.58	1304.87	1304.18	.69	.82	0.51	12596.90	12598.39
3.89	95	44564.43	2.34	12308.43	28927.37	3326.29	3322.13	4.16	4.14	0.99	30202.08	30200.13

90 1356 PP 51 52 10.973 131 13 22.872

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.70	85	14346.85	2.35	12309.90	0.00	2034.60	2033.54	1.06	2.63			
3.43	70	26981.74	2.35	12308.94	13343.58	1326.87	1326.29	.58	.67	0.51	12635.40	12636.33
3.89	95	44538.17	2.35	12308.43	28927.37	3300.02	3296.22	3.80	4.06	0.99	30192.31	30190.05

90 1356 R PP 51 52 14.513 131 13 3.853

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.70	85	14346.85	2.35	12309.90	0.00	2034.60	2032.30	2.30	2.63			
3.43	70	26981.74	2.35	12308.94	13343.58	1326.87	1325.93	.94	.67	0.51	12635.40	12637.21
3.89	95	44538.17	2.35	12308.43	28927.37	3300.02	3295.32	4.70	4.06	0.99	30192.31	30190.39

90 1424 FF 51 50 32.570 131 10 18.502

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.69	86	14337.97	2.35	12309.90	0.00	2025.72	2022.62	3.10	2.64			
3.50	70	26992.52	2.35	12308.94	13343.58	1337.65	1336.55	1.10	.69	0.51	12655.06	12657.51
3.91	96	44524.39	2.35	12308.43	28927.37	3286.24	3281.04	5.20	4.02	0.99	30187.41	30185.79

90 1424 R FF 51 50 33.111 131 10 30.621

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.C.
3.69	86	14337.97	2.35	12309.90	0.00	2025.72	2023.39	2.33	2.64			
3.50	70	26992.52	2.35	12308.94	13343.58	1337.65	1336.49	1.16	.69	0.51	12655.06	12656.68
3.91	96	44524.39	2.35	12308.43	28927.37	3286.24	3281.75	4.49	4.02	0.99	30187.41	30185.73

90 1544 R FP 52 1 4.490 131 12 22.312

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.C.
3.70	86	14341.10	2.37	12309.90	0.00	2028.83	2026.11	2.72	2.64			
3.43	70	26927.14	2.37	12308.94	13343.58	1272.25	1271.27	.98	.78	0.51	12586.55	12588.74
3.92	95	44562.35	2.37	12308.43	28927.37	3324.18	3319.26	4.92	3.90	0.99	30222.24	30220.52

90 1730 PP 52 6 6.585 131 8 12.887

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.75	86	14324.11	2.39	12309.90	0.00	2011.82	2008.91	2.91	2.86			
3.46	72	26896.45	2.39	12308.94	13343.58	1241.54	1240.32	1.22	.68	0.51	12572.85	12574.99
3.91	95	44563.53	2.39	12308.43	28927.37	3325.34	3320.77	4.57	3.97	0.99	30240.41	30239.23

90 1842 PP 52 6 4.605 131 8 11.027

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.75	87	14324.10	2.40	12309.90	0.00	2011.80	2008.80	3.00	2.86			
3.45	72	26896.45	2.40	12308.94	13343.58	1241.53	1240.53	1.00	.68	0.51	12572.86	12575.31
3.93	95	44563.54	2.40	12308.43	28927.37	3325.34	3320.57	4.77	3.97	0.99	30240.43	30239.14

90 2124 R FF 52 2 8.768 131 31 36.918

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.67	86	14413.90	2.43	12309.90	0.00	2101.57	2099.18	2.39	2.62			
3.42	70	26921.78	2.43	12308.94	13343.58	1266.83	1266.02	.81	.93	0.51	12508.39	12510.42
3.91	95	44629.68	2.43	12308.43	28927.37	3391.45	3386.90	4.55	3.97	0.99	30216.77	30215.09

90 2310 FF 52 0 49.051 131 56 20.621

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.65	87	14509.57	2.45	12309.90	0.00	2197.22	2193.95	3.27	2.59			
3.59	73	26937.57	2.45	12308.94	13343.58	1282.60	1281.73	.87	.88	0.51	12428.51	12431.36
3.78	98	44710.64	2.45	12308.43	28927.37	3472.39	3466.64	5.75	3.99	0.99	30202.06	30200.06

90 2310 R FF 52 0 54.092 131 56 43.000

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.65	87	14509.57	2.45	12309.90	0.00	2197.22	2195.34	1.88	2.59			
3.59	73	26937.57	2.45	12308.94	13343.58	1282.60	1281.38	1.22	.88	0.51	12428.51	12429.62
3.78	98	44710.64	2.45	12308.43	28927.37	3472.39	3468.14	4.25	3.99	0.99	30202.06	30200.17

90 2344 FF 52 3 59.856 132 2 2.903

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.69	87	14528.13	2.46	12309.90	0.00	2215.77	2214.63	1.14	2.69			
3.63	74	26920.16	2.46	12308.94	13343.58	1265.18	1264.84	.34	.91	0.51	12392.54	12393.79
3.89	97	44737.25	2.46	12308.43	28927.37	3498.99	3495.01	3.98	3.94	0.99	30210.11	30207.75

90 2344 R FF 52 4 6.276 132 1 45.203

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.69	87	14528.13	2.46	12309.90	0.00	2215.77	2213.48	2.29	2.69			
3.63	74	26920.16	2.46	12308.94	13343.58	1265.18	1264.04	1.14	.91	0.51	12392.54	12394.14
3.89	97	44737.25	2.46	12308.43	28927.37	3498.99	3494.31	4.68	3.94	0.99	30210.11	30208.20

91 058 PP 52 11 26.145 132 13 23.146

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.67	88	14571.20	2.47	12309.90	0.00	2258.83	2255.95	2.88	2.79			
3.64	73	26882.03	2.47	12308.94	13343.58	1227.04	1225.73	1.31	.90	0.51	12311.34	12313.36
3.92	97	44797.75	2.47	12308.43	28927.37	3559.48	3554.55	4.93	3.96	0.99	30227.54	30225.97

91 216 GG 52 20 15.955 132 25 42.904

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.72	88	14616.87	2.49	12309.90	0.00	2304.48	2301.66	2.82	2.69			
3.55	72	26837.73	2.49	12308.94	13343.58	1182.72	1180.87	1.85	1.62	0.51	12221.37	12222.79
3.97	97	44864.49	2.49	12308.43	28927.37	3626.20	3621.37	4.83	3.93	0.99	30248.61	30247.08

91 216 R GG 52 20 15.895 132 25 48.843

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.72	88	14616.87	2.49	12309.90	0.00	2304.48	2302.04	2.44	2.69			
3.55	72	26837.73	2.49	12308.94	13343.58	1182.72	1180.95	1.77	1.62	0.51	12221.37	12222.49
3.97	97	44864.49	2.49	12308.43	28927.37	3626.20	3621.70	4.50	3.93	0.99	30248.61	30247.03

91 244 FF 52 23 31.018 132 30 37.667

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.65	88	14635.39	2.49	12309.90	0.00	2323.00	2320.17	2.83	2.76			
3.49	72	26822.68	2.49	12308.94	13343.58	1167.67	1165.31	2.36	1.59	0.51	12187.80	12188.72
3.96	97	44890.06	2.49	12308.43	28927.37	3651.77	3647.23	4.54	3.89	0.99	30255.66	30254.43

91 3 8 GG 52 25 28.921 132 33 46.837

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.69	88	14647.05	2.50	12309.90	0.00	2334.65	2332.11	2.54	2.79			
3.50	70	26813.34	2.50	12308.94	13343.58	1158.32	1156.27	2.05	1.56	0.51	12166.80	12167.74
3.90	97	44906.25	2.50	12308.43	28927.37	3667.95	3663.46	4.49	3.89	0.99	30260.19	30258.72

91 3 8 R GG 52 25 27.481 132 33 46.717

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.69	88	14647.05	2.50	12309.90	0.00	2334.65	2332.10	2.55	2.79			
3.50	70	26813.34	2.50	12308.94	13343.58	1158.32	1156.41	1.91	1.56	0.51	12166.80	12167.89
3.90	97	44906.25	2.50	12308.43	28927.37	3667.95	3663.38	4.57	3.89	0.99	30260.19	30258.65

91 4 2 FB 52 32 1.388 132 43 15.605

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.64	89	14681.96	2.51	12309.90	0.00	2369.55	2368.35	1.20	2.70			
3.52	71	26783.38	2.51	12308.94	13343.58	1128.35	1126.35	2.00	1.52	0.51	12101.93	12101.58
3.89	97	44955.46	2.51	12308.43	28927.37	3717.15	3714.08	3.07	3.73	0.99	30274.49	30273.10

91 432 GG 52 35 54.852 132 48 20.986

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.66	90	14702.93	2.51	12309.90	0.00	2390.52	2388.08	2.44	2.87			
3.55	70	26765.92	2.51	12308.94	13343.58	1110.89	1108.75	2.14	1.31	0.51	12063.50	12064.25
3.88	96	44984.80	2.51	12308.43	28927.37	3746.49	3742.37	4.12	3.81	0.99	30282.86	30281.66

91 550 FF 52 46 14.063 133 2 56.096

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.O.	CALC T.D.
3.69	91	14760.51	2.53	12309.90	0.00	2448.08	2445.29	2.79	2.97			
3.46	68	26722.73	2.53	12308.94	13343.58	1067.68	1066.21	1.47	1.27	0.51	11962.73	11964.50
3.83	96	45063.64	2.53	12308.43	28927.37	3825.31	3820.95	4.36	3.65	0.99	30304.12	30303.03

91 638 FF 52 53 19.049 133 10 54.504

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.69	91	14792.64	2.54	12309.90	0.00	2480.20	2477.60	2.60	3.00			
3.57	67	26693.57	2.54	12308.94	13343.58	1038.51	1036.74	1.77	1.35	0.51	11901.44	11902.72
3.84	96	45110.59	2.54	12308.43	28927.37	3872.25	3868.16	4.09	3.35	0.99	30318.94	30317.93

91 824 FF 53 10 37.597 133 25 42.493

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.70	91	14856.78	2.56	12309.90	0.00	2544.32	2541.44	2.88	3.23			
3.54	68	26620.56	2.56	12308.94	13343.58	965.48	964.21	1.27	1.19	0.51	11764.29	11766.35
3.83	98	45211.07	2.56	12308.43	28927.37	3972.71	3968.45	4.26	3.24	0.99	30355.28	30354.38

91 824 R FF 53 10 40.538 133 25 44.773

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.70	91	14856.78	2.56	12309.90	0.00	2544.32	2541.61	2.71	3.23			
3.54	68	26620.56	2.56	12308.94	13343.58	965.48	964.01	1.47	1.19	0.51	11764.29	11765.98
3.83	98	45211.07	2.56	12308.43	28927.37	3972.71	3968.72	3.99	3.24	0.99	30355.28	30354.48

91 1010 FP 53 27 43.906 133 40 39.902

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.69	92	14924.88	2.58	12309.90	0.00	2612.40	2608.98	3.42	3.24			
3.46	65	26559.50	2.58	12308.94	13343.58	904.40	902.81	1.59	1.08	0.51	11635.13	11637.41
3.84	100	45312.48	2.58	12308.43	28927.37	4074.10	4069.16	4.94	3.41	0.99	30388.59	30387.55

91 1010 R FP 53 27 43.366 133 40 46.442

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.69	92	14924.88	2.58	12309.90	0.00	2612.40	2609.37	3.03	3.24			
3.46	65	26559.50	2.58	12308.94	13343.58	904.40	903.08	1.32	1.08	0.51	11635.13	11637.29
3.84	100	45312.48	2.58	12308.43	28927.37	4074.10	4069.49	4.61	3.41	0.99	30388.59	30387.49

91 1150 GG 53 44 59.804 133 45 43.925

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.66	91	14959.45	2.59	12309.90	0.00	2646.96	2643.84	3.12	3.50			
3.44	64	26485.11	2.59	12308.94	13343.58	830.00	828.80	1.20	1.00	0.51	11526.17	11528.54
3.85	101	45382.82	2.59	12308.43	28927.37	4144.43	4139.71	4.72	3.86	0.99	30424.36	30423.24

91 1150 R GG 53 44 57.224 133 45 39.966

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.66	91	14959.45	2.59	12309.90	0.00	2646.96	2643.55	3.41	3.50			
3.44	64	26485.11	2.59	12308.94	13343.58	830.00	828.85	1.15	1.00	0.51	11526.17	11528.88
3.85	101	45382.82	2.59	12308.43	28927.37	4144.43	4139.37	5.06	3.86	0.99	30424.36	30423.19

91 13 8 FR 53 58 6.748 133 34 30.887

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.64	91	14934.33	2.61	12309.90	0.00	2621.82	2618.89	2.93	3.80			
3.40	63	26395.76	2.61	12308.94	13343.58	740.63	740.40	.23	.88	0.51	11461.94	11465.09
3.83	102	45391.21	2.61	12308.43	28927.37	4152.80	4147.69	5.11	4.57	0.99	30457.87	30456.17

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 91 13 8 R    BB                 53 58  8.308   133 34 28.487
            OBS   CLOCK   CLOCK  EMISSION  CORR     CALC   OBS  CALC MON.    OBS       CALC
CYCLE GAIN  TOA    RATE   SYNCH    DELAY    TOA      TOA   ASF   ASF CORR   T.D.      T.D.
 3.64   91 14934.33  2.61 12309.90     0.00 2621.82 2618.78 3.04 3.80
 3.40   63 26395.76  2.61 12308.94 13343.58  740.63  740.19  .44  .88 0.51 11461.94 11464.99
 3.83  102 45391.21  2.61 12308.43 28927.37 4152.80 4147.66 5.14 4.57 0.99 30457.87 30456.25

 91 1336      GF                 54  2 57.861   133 29 45.341
            OBS   CLOCK   CLOCK  EMISSION  CORR     CALC   OBS  CALC MON.    OBS       CALC
CYCLE GAIN  TOA    RATE   SYNCH    DELAY    TOA      TOA   ASF   ASF CORR   T.D.      T.D.
 3.64   92 14925.37  2.61 12309.90     0.00 2612.86 2608.36 4.50 3.89
 3.47   63 26363.17  2.61 12308.94 13343.58  708.04  706.44 1.60  .93 0.51 11438.31 11441.66
 3.83  103 45394.11  2.61 12308.43 28927.37 4155.70 4149.39 6.31 4.78 0.99 30469.73 30468.40

 91 1336 R    GF                 54  2 57.261   133 29 54.700
            OBS   CLOCK   CLOCK  EMISSION  CORR     CALC   OBS  CALC MON.    OBS       CALC
CYCLE GAIN  TOA    RATE   SYNCH    DELAY    TOA      TOA   ASF   ASF CORR   T.D.      T.D.
 3.64   92 14925.37  2.61 12309.90     0.00 2612.86 2608.90 3.96 3.89
 3.47   63 26363.17  2.61 12308.94 13343.58  708.04  706.87 1.17  .93 0.51 11438.31 11441.55
 3.83  103 45394.11  2.61 12308.43 28927.37 4155.70 4149.83 5.87 4.78 0.99 30469.73 30468.30

 91 1424      GG                 54 11 24.130   133 22 12.269
            OBS   CLOCK   CLOCK  EMISSION  CORR     CALC   OBS  CALC MON.    OBS       CALC
CYCLE GAIN  TOA    RATE   SYNCH    DELAY    TOA      TOA   ASF   ASF CORR   T.D.      T.D.
 3.63   96 14909.28  2.62 12309.90     0.00 2596.76 2593.75 3.01 4.01
 3.47   62 26304.95  2.62 12308.94 13343.58  649.81  649.43  .38  .90 0.51 11396.18 11399.26
 3.93  103 45399.10  2.62 12308.43 28927.37 4160.68 4155.36 5.32 4.82 0.99 30490.81 30488.98

 91 1424 R    GG                 54 11 21.910   133 22 16.229
            OBS   CLOCK   CLOCK  EMISSION  CORR     CALC   OBS  CALC MON.    OBS       CALC
CYCLE GAIN  TOA    RATE   SYNCH    DELAY    TOA      TOA   ASF   ASF CORR   T.D.      T.D.
 3.63   96 14909.28  2.62 12309.90     0.00 2596.76 2593.93 2.83 4.01
 3.47   62 26304.95  2.62 12308.94 13343.58  649.81  649.76  .05  .90 0.51 11396.18 11399.41
 3.93  103 45399.10  2.62 12308.43 28927.37 4160.68 4155.43 5.25 4.82 0.99 30490.81 30488.87
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91 1450 GG 54 16 3.844 133 18 49.641

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.65	92	14904.49	2.63	12309.90	0.00	2591.96	2589.09	2.87	3.52			
3.44	62	26275.57	2.63	12308.94	13343.58	620.42	620.15	.27	.95	0.51	11371.59	11374.64
4.02	103	45405.20	2.63	12308.43	28927.37	4166.77	4161.46	5.31	5.12	0.99	30501.70	30499.74

91 1526 PP 54 22 14.817 133 14 10.511

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.66	92	14897.57	2.64	12309.90	0.00	2585.03	2582.95	2.08	3.30			
3.52	62	26237.26	2.64	12308.94	13343.58	582.10	581.25	.85	.92	0.51	11340.20	11341.88
3.97	103	45412.18	2.64	12308.43	28927.37	4173.74	4169.45	4.29	4.93	0.99	30515.60	30513.87

91 1526 R PP 54 22 3.056 133 13 54.552

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.66	92	14897.57	2.64	12309.90	0.00	2585.03	2581.69	3.34	3.30			
3.52	62	26237.26	2.64	12308.94	13343.58	582.10	581.40	.70	.92	0.51	11340.20	11343.29
3.97	103	45412.18	2.64	12308.43	28927.37	4173.74	4167.97	5.77	4.93	0.99	30515.60	30513.65

91 1546 FF 54 23 17.570 133 8 7.278

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.67	92	14878.94	2.64	12309.90	0.00	2566.40	2563.69	2.71	3.39			
3.48	61	26217.17	2.64	12308.94	13343.58	562.01	561.08	.93	.88	0.51	11338.74	11340.97
3.97	103	45398.59	2.64	12308.43	28927.37	4160.15	4155.31	4.84	4.93	0.99	30520.64	30518.99

91 1610 FP 54 23 25.602 133 0 10.591

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.67	91	14851.79	2.64	12309.90	0.00	2539.25	2536.36	2.89	3.39			
3.50	59	26196.64	2.64	12308.94	13343.58	541.48	540.50	.98	1.01	0.51	11345.36	11347.72
4.11	106	45395.03	2.64	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

91 1610 R FP 54 23 27.642 133 0 1.831

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.67	91	14851.79	2.64	12309.90	0.00	2539.25	2535.91	3.34	3.39			
3.50	59	26196.64	2.64	12308.94	13343.58	541.48	539.98	1.50	1.01	0.51	11345.36	11347.65
4.11	106	45395.03	2.64	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

91 1638 GG 54 22 56.794 132 52 .826

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.67	92	14822.10	2.65	12309.90	0.00	2509.55	2507.22	2.33	3.38			
3.42	60	26178.49	2.65	12308.94	13343.58	523.32	523.00	.32	1.03	0.51	11356.90	11359.36
0.00	0	0.00	2.65	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

91 1638 R GG 54 22 59.674 132 51 51.826

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.67	92	14822.10	2.65	12309.90	0.00	2509.55	2506.78	2.77	3.38			
3.42	60	26178.49	2.65	12308.94	13343.58	523.32	522.42	.90	1.03	0.51	11356.90	11359.22
0.00	0	0.00	2.65	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

91 1732 PP 54 21 33.617 132 34 .381

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.69	92	14759.32	2.66	12309.90	0.00	2446.76	2442.41	4.35	3.42			
3.42	58	26146.88	2.66	12308.94	13343.58	491.70	490.04	1.66	.96	0.51	11388.07	11391.21
0.00	0	0.00	2.66	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

91 1732 R PP 54 21 40.818 132 34 37.280

CYCLE	GAIN	OPS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OPS T.D.	CALC T.D.
3.69	92	14759.32	2.66	12309.90	0.00	2446.76	2444.76	2.00	3.42			
3.62	58	26146.88	2.66	12308.94	13343.58	491.70	490.69	1.01	.96	0.51	11388.07	11389.51
0.00	0	0.00	2.66	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

91 1758 FF 54 21 36.310 132 26 17.194

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.67	92	14730.51	2.66	12309.90	0.00	2417.95	2415.84	2.11	3.43			
3.53	57	26130.52	2.66	12308.94	13343.58	475.34	474.54	.80	.84	0.51	11400.52	11402.28
0.00	0	0.00	2.66	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

91 1758 R FF 54 21 32.469 132 26 1.835

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.67	92	14730.51	2.66	12309.90	0.00	2417.95	2414.84	3.11	3.43			
3.53	57	26130.52	2.66	12308.94	13343.58	475.34	474.39	.95	.84	0.51	11400.52	11403.13
0.00	0	0.00	2.66	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

91 1918 RR 54 20 54.647 132 3 15.736

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.64	91	14651.51	2.68	12309.90	0.00	2338.93	2335.24	3.69	3.49			
3.50	57	26096.07	2.68	12308.94	13343.58	440.87	440.15	.72	.82	0.51	11445.07	11448.49
0.00	0	0.00	2.68	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

91 2030 FF 54 19 55.231 131 46 22.008

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.67	91	14591.79	2.69	12309.90	0.00	2279.20	2275.33	3.87	3.54			
3.37	57	26082.68	2.69	12308.94	13343.58	427.47	426.26	1.21	.72	0.51	11491.40	11494.51
0.00	0	0.00	2.69	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

91 2030 R FF 54 19 53.372 131 46 37.187

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.67	91	14591.79	2.69	12309.90	0.00	2279.20	2276.13	3.07	3.54			
3.37	57	26082.68	2.69	12308.94	13343.58	427.47	426.68	.79	.72	0.51	11491.40	11494.13
0.00	0	0.00	2.69	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

91 2254 PP 54 22 30.116 131 10 48.342

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.65	90	14475.42	2.72	12309.90	0.00	2162.80	2159.76	3.04	3.60			
3.35	57	26051.58	2.72	12308.94	13343.58	396.34	395.82	.52	.54	0.51	11576.67	11579.64
0.00	0	0.00	2.72	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

91 2254 R PP 54 22 30.596 131 10 48.342

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.65	90	14475.42	2.72	12309.90	0.00	2162.80	2159.77	3.03	3.60			
3.35	57	26051.58	2.72	12308.94	13343.58	396.34	395.77	.57	.54	0.51	11576.67	11579.58
0.00	0	0.00	2.72	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

92 0 4 R RR 54 13 47.633 131 2 54.081

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.67	91	14429.66	2.73	12309.90	0.00	2117.03	2114.12	2.91	3.81			
3.43	57	26107.64	2.73	12308.94	13343.58	452.39	451.59	.80	.49	0.51	11678.49	11681.05
0.00	0	0.00	2.73	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

92 040 R GG 54 5 39.656 131 2 29.084

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.70	92	14411.50	2.74	12309.90	0.00	2098.86	2096.07	2.79	3.76			
3.43	59	26157.66	2.74	12308.94	13343.58	502.40	501.87	.53	.50	0.51	11746.67	11749.38
4.27	117	44971.22	2.74	12308.43	28927.37	3732.68	3727.50	5.18	5.99	0.99	30560.71	30558.80

92 154 FF 53 48 41.701 130 59 32.436

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.73	91	14370.14	2.75	12309.90	0.00	2057.49	2054.52	2.97	3.65			
3.41	61	26263.33	2.75	12308.94	13343.58	608.06	607.48	.58	.50	0.51	11893.70	11896.54
3.70	110	44896.61	2.75	12308.43	28927.37	3658.06	3652.62	5.44	5.70	0.99	30527.46	30525.47

92 154 R FF 53 48 43.921 130 59 34.116

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.73	91	14370.14	2.75	12309.90	0.00	2057.49	2054.68	2.81	3.65			
3.41	61	26263.33	2.75	12308.94	13343.58	608.06	607.24	.82	.50	0.51	11893.70	11896.14
3.70	110	44896.61	2.75	12308.43	28927.37	3658.06	3652.85	5.21	5.70	0.99	30527.46	30525.54

92 228 GG 53 40 52.984 130 59 1.618

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.71	91	14355.25	2.76	12309.90	0.00	2042.59	2039.88	2.71	3.67			
3.45	61	26311.27	2.76	12308.94	13343.58	655.99	655.83	.16	.50	0.51	11956.53	11959.53
3.85	108	44846.50	2.76	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

92 228 R GG 53 40 57.064 130 58 54.358

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.71	91	14355.25	2.76	12309.90	0.00	2042.59	2039.56	3.03	3.67			
3.45	61	26311.27	2.76	12308.94	13343.58	655.99	655.45	.54	.50	0.51	11956.53	11959.47
3.85	108	44846.50	2.76	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

92 312 FF 53 31 14.108 130 58 53.724

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.70	89	14339.82	2.77	12309.90	0.00	2027.15	2025.05	2.10	3.46			
3.39	62	26371.32	2.77	12308.94	13343.58	716.03	715.40	.63	.50	0.51	12032.01	12033.93
3.84	104	44826.71	2.77	12308.43	28927.37	3588.14	3584.02	4.12	4.71	0.99	30487.88	30486.34

92 312 R FF 53 31 12.188 130 58 39.205

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.70	89	14339.82	2.77	12309.90	0.00	2027.15	2024.14	3.01	3.46			
3.39	62	26371.32	2.77	12308.94	13343.58	716.03	715.67	.36	.50	0.51	12032.01	12035.11
3.84	104	44826.71	2.77	12308.43	28927.37	3588.14	3583.19	4.95	4.71	0.99	30487.88	30486.42

92 340 GF 53 25 19.149 130 57 50.562

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.67	88	14328.20	2.77	12309.90	0.00	2015.53	2013.27	2.26	3.35			
3.42	63	26408.09	2.77	12308.94	13343.58	752.80	752.23	.57	.50	0.51	12080.40	12082.54
3.85	102	44801.74	2.77	12308.43	28927.37	3563.17	3558.76	4.41	4.64	0.99	30474.53	30472.86

92 340 R GF 53 25 16.929 130 57 28.483

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.67	88	14328.20	2.77	12309.90	0.00	2015.53	2011.89	3.64	3.35			
3.42	63	26408.09	2.77	12308.94	13343.58	752.80	752.57	.23	.50	0.51	12080.40	12084.26
3.85	102	44801.74	2.77	12308.43	28927.37	3563.17	3557.54	5.63	4.64	0.99	30474.53	30473.02

92 5 0 FF 53 8 37.214 130 55 38.250

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.70	87	14301.36	2.79	12309.90	0.00	1988.67	1986.00	2.67	3.16			
3.40	64	26511.58	2.79	12308.94	13343.58	856.27	855.95	.32	.49	0.51	12210.73	12213.53
3.84	99	44734.02	2.79	12308.43	28927.37	3495.43	3490.77	4.66	4.31	0.99	30433.65	30432.14

92 534 FF 53 1 43.635 130 54 31.249

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.69	87	14290.60	2.80	12309.90	0.00	1977.90	1975.43	2.47	3.01			
3.44	67	26554.96	2.80	12308.94	13343.58	899.64	898.83	.81	.49	0.51	12264.87	12266.98
3.83	98	44705.84	2.80	12308.43	28927.37	3467.24	3462.56	4.68	4.12	0.99	30416.23	30414.50

92 534 R FF 53 1 35.955 130 54 34.550

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.69	87	14290.60	2.80	12309.90	0.00	1977.90	1975.52	2.38	3.01			
3.44	67	26554.96	2.80	12308.94	13343.58	899.64	899.60	.04	.49	0.51	12264.87	12267.66
3.83	98	44705.84	2.80	12308.43	28927.37	3467.24	3462.27	4.97	4.12	0.99	30416.23	30414.12

92 916 GG 52 19 47.461 130 24 48.866

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.68	85	14157.63	2.84	12309.90	0.00	1844.89	1843.06	1.83	2.44			
3.49	70	26825.71	2.84	12308.94	13343.58	1170.35	1169.95	.40	.48	0.51	12668.59	12670.47
3.78	91	44466.25	2.84	12308.43	28927.37	3227.61	3224.08	3.53	3.40	0.99	30309.61	30308.39

92 916 R GG 52 19 45.961 130 24 46.226

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.68	85	14157.63	2.84	12309.90	0.00	1844.89	1842.89	2.00	2.44			
3.49	70	26825.71	2.84	12308.94	13343.58	1170.35	1170.12	.23	.48	0.51	12668.59	12670.81
3.78	91	44466.25	2.84	12308.43	28927.37	3227.61	3223.85	3.76	3.40	0.99	30309.61	30308.33

92 11 2 R FF 52 1 19.785 130 2 53.089

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.71	84	14076.24	2.86	12309.90	0.00	1763.48	1760.89	2.59	2.71			
3.57	70	26952.71	2.86	12308.94	13343.58	1297.33	1297.08	.25	.70	0.51	12876.98	12879.77
3.75	90	44334.71	2.86	12308.43	28927.37	3096.05	3091.99	4.06	2.93	0.99	30259.46	30258.47

92 1336 FF 51 34 34.944 129 32 15.224

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.75	85	13973.06	2.89	12309.90	0.00	1660.27	1658.32	1.95	2.73			
3.48	73	27140.26	2.89	12308.94	13343.58	1484.85	1484.60	.25	.96	0.51	13167.71	13169.86
3.77	90	44147.58	2.89	12308.43	28927.37	2908.89	2904.59	4.30	3.49	0.99	30175.51	30173.64

92 14 0 GG 51 30 58.880 129 27 20.701

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.76	84	13957.40	2.89	12309.90	0.00	1644.61	1642.75	1.86	2.73			
3.49	73	27167.37	2.89	12308.94	13343.58	1511.96	1510.90	1.06	.98	0.51	13210.48	13211.73
3.78	89	44119.42	2.89	12308.43	28927.37	2880.73	2876.82	3.91	3.65	0.99	30163.01	30161.44

92 14 0 R GG 51 31 1.460 129 27 13.561

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.76	84	13957.40	2.89	12309.90	0.00	1644.61	1642.26	2.35	2.73			
3.49	73	27167.37	2.89	12308.94	13343.58	1511.96	1510.76	1.20	.98	0.51	13210.48	13212.08
3.78	89	44119.42	2.89	12308.43	28927.37	2880.73	2876.56	4.17	3.65	0.99	30163.01	30161.67

92 1434 FF 51 26 2.894 129 20 5.005

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.69	84	13934.67	2.90	12309.90	0.00	1621.87	1619.90	1.97	2.75			
3.43	73	27204.21	2.90	12308.94	13343.58	1548.79	1547.62	1.17	.99	0.51	13270.05	13271.30
3.83	91	44079.75	2.90	12308.43	28927.37	2841.05	2836.98	4.07	4.10	0.99	30146.07	30144.45

92 1434 R FF 51 26 8.054 129 19 51.565

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.69	84	13934.67	2.90	12309.90	0.00	1621.87	1618.96	2.91	2.75			
3.43	73	27204.21	2.90	12308.94	13343.58	1548.79	1547.34	1.45	.99	0.51	13270.05	13271.96
3.83	91	44079.75	2.90	12308.43	28927.37	2841.05	2836.51	4.54	4.10	0.99	30146.07	30144.92

92 1546 GG 51 17 35.344 129 6 58.746

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.71	85	13895.81	2.91	12309.90	0.00	1583.00	1579.76	3.24	2.69			
3.49	75	27268.46	2.91	12308.94	13343.58	1613.03	1611.81	1.22	1.29	0.51	13373.16	13375.63
3.85	91	44010.40	2.91	12308.43	28927.37	2771.69	2766.46	5.23	4.18	0.99	30115.58	30114.07

92 17 8 GG 51 7 44.034 128 53 19.012

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.73	84	13856.82	2.93	12309.90	0.00	1543.99	1541.66	2.33	2.68			
3.52	77	27342.37	2.93	12308.94	13343.58	1686.92	1685.55	1.37	1.47	0.51	13486.06	13487.47
0.00	0	0.00	2.93	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

92 17 8 R GG 51 7 41.694 128 53 20.872

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.73	84	13856.82	2.93	12309.90	0.00	1543.99	1541.83	2.16	2.68			
3.52	77	27342.37	2.93	12308.94	13343.58	1686.92	1685.75	1.17	1.47	0.51	13486.06	13487.50
0.00	0	0.00	2.93	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

92 1734 PP 51 4 36.770 128 48 30.907

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.74	84	13843.88	2.93	12309.90	0.00	1531.05	1528.41	2.64	2.79			
3.56	77	27366.63	2.93	12308.94	13343.58	1711.18	1709.60	1.58	1.51	0.51	13523.26	13524.77
3.80	92	43907.53	2.93	12308.43	28927.37	2668.80	2663.67	5.13	4.67	0.99	30064.64	30062.63

92 1812 GG 50 59 42.225 128 42 7.409

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.72	85	13828.21	2.94	12309.90	0.00	1515.37	1512.57	2.80	2.85			
3.54	78	27402.85	2.94	12308.94	13343.58	1747.39	1746.16	1.23	1.54	0.51	13575.15	13577.17
3.85	93	43871.02	2.94	12308.43	28927.37	2632.28	2626.78	5.50	4.71	0.99	30043.80	30041.58

92 1812 R GG 50 59 45.885 128 42 9.749

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.72	85	13828.21	2.94	12309.90	0.00	1515.37	1512.61	2.76	2.85			
3.54	78	27402.85	2.94	12308.94	13343.58	1747.39	1745.75	1.64	1.54	0.51	13575.15	13576.72
3.85	93	43871.02	2.94	12308.43	28927.37	2632.28	2627.10	5.18	4.71	0.99	30043.80	30041.86

92 2120 R FF 50 31 38.736 128 28 32.094

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.74	86	13835.28	2.98	12309.90	0.00	1522.40	1520.57	1.83	3.11			
3.62	79	27585.03	2.98	12308.94	13343.58	1929.53	1927.83	1.70	1.51	0.51	13750.26	13750.84
3.92	95	43738.60	2.98	12308.43	28927.37	2499.82	2495.96	3.86	4.49	0.99	29904.31	29902.76

92 23 6 FF 50 25 23.421 128 9 48.699

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.64	83	13783.35	3.00	12309.90	0.00	1470.45	1468.82	1.63	3.00			
3.46	80	27645.10	3.00	12308.94	13343.58	1989.58	1987.99	1.59	1.75	0.51	13862.26	13862.75
3.95	96	43655.78	3.00	12308.43	28927.37	2416.98	2412.48	4.50	4.77	0.99	29873.42	29871.03

92 23 6 R FF 50 25 24.380 128 9 25.060

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.64	83	13783.35	3.00	12309.90	0.00	1470.45	1467.37	3.08	3.00			
3.46	80	27645.10	3.00	12308.94	13343.58	1989.58	1988.41	1.17	1.75	0.51	13862.26	13864.62
3.95	96	43655.78	3.00	12308.43	28927.37	2416.98	2411.15	5.83	4.77	0.99	29873.42	29871.15

93 2210 FP 50 32 56.255 128 27 28.913

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.67	85	13829.81	3.26	12309.90	0.00	1516.65	1513.64	3.01	3.15			
3.52	79	27578.80	3.26	12308.94	13343.58	1923.02	1921.49	1.53	1.47	0.51	13749.50	13751.43
0.00	0	0.00	3.26	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

93 23 4 FF INT 50 31 41.567 128 41 15.212

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.66	86	13881.67	3.27	12309.90	0.00	1568.50	1566.78	1.72	3.05			
3.52	78	27569.38	3.27	12308.94	13343.58	1913.59	1912.79	.80	1.35	0.51	13688.22	13689.59
0.00	0	0.00	3.27	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

93 23 4 R FP INT 50 31 47.027 128 41 1.472

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.66	86	13881.67	3.27	12309.90	0.00	1568.50	1565.73	2.77	3.05			
3.52	78	27569.38	3.27	12308.94	13343.58	1913.59	1912.50	1.09	1.35	0.51	13688.22	13690.35
0.00	0	0.00	3.27	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

94 0 0 GG 50 29 .479 128 54 35.655

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.69	85	13937.92	3.28	12309.90	0.00	1624.74	1621.80	2.94	2.94			
3.45	76	27571.35	3.28	12308.94	13343.58	1915.55	1914.49	1.06	.95	0.51	13633.94	13636.27
0.00	0	0.00	3.28	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

94 0 0 R GG 50 28 57.299 128 54 35.116

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.69	85	13937.92	3.28	12309.90	0.00	1624.74	1621.89	2.85	2.94			
3.45	76	27571.35	3.28	12308.94	13343.58	1915.55	1914.82	.73	.95	0.51	13633.94	13636.51
0.00	0	0.00	3.28	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

94 050 R GP 50 25 57.611 129 7 33.000

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.67	86	13991.28	3.29	12309.90	0.00	1678.09	1676.32	1.77	2.89			
3.42	77	27576.96	3.29	12308.94	13343.58	1921.15	1920.14	1.01	1.00	0.51	13586.19	13587.40
4.42	106	43861.25	3.29	12308.43	28927.37	2622.16	2618.60	3.56	3.62	0.99	29870.96	29869.65

94 138 FF 50 23 5.661 129 18 43.068

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.71	86	14039.99	3.30	12309.90	0.00	1726.79	1723.92	2.87	2.87			
3.41	76	27584.06	3.30	12308.94	13343.58	1928.24	1927.55	.69	.86	0.51	13544.58	13547.21
3.87	94	43894.82	3.30	12308.43	28927.37	2655.72	2651.46	4.26	3.56	0.99	29855.82	29854.91

94 138 R FF 50 23 3.981 129 18 47.808

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.71	86	14039.99	3.30	12309.90	0.00	1726.79	1724.28	2.51	2.87			
3.41	76	27584.06	3.30	12308.94	13343.58	1928.24	1927.65	.59	.86	0.51	13544.58	13546.95
3.87	94	43894.82	3.30	12308.43	28927.37	2655.72	2651.68	4.04	3.56	0.99	29855.82	29854.77

94 156 GG 50 22 5.245 129 23 1.363

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.69	86	14058.09	3.30	12309.90	0.00	1744.89	1742.05	2.84	2.85			
3.43	76	27586.66	3.30	12308.94	13343.58	1930.84	1930.08	.76	.93	0.51	13529.08	13531.61
3.95	94	43907.81	3.30	12308.43	28927.37	2668.71	2664.53	4.18	3.47	0.99	29850.71	29849.85

94 156 R GG 50 22 5.065 129 22 57.403

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.69	86	14058.09	3.30	12309.90	0.00	1744.89	1741.82	3.07	2.85			
3.43	76	27586.66	3.30	12308.94	13343.58	1930.84	1930.16	.68	.93	0.51	13529.08	13531.92
3.95	94	43907.81	3.30	12308.43	28927.37	2668.71	2664.28	4.43	3.47	0.99	29850.71	29849.83

94 238 FF 50 19 33.635 129 33 24.451

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.71	86	14102.39	3.31	12309.90	0.00	1789.18	1786.03	3.15	2.82			
3.47	76	27593.35	3.31	12308.94	13343.58	1937.52	1937.40	.12	.76	0.51	13491.47	13494.95
3.83	94	43940.41	3.31	12308.43	28927.37	2701.30	2696.12	5.18	3.25	0.99	29839.01	29837.46

94 238 R FF 50 19 34.355 129 33 34.171

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.71	86	14102.39	3.31	12309.90	0.00	1789.18	1786.60	2.58	2.82			
3.47	76	27593.35	3.31	12308.94	13343.58	1937.52	1937.20	.32	.76	0.51	13491.47	13494.18
3.83	94	43940.41	3.31	12308.43	28927.37	2701.30	2696.74	4.56	3.25	0.99	29839.01	29837.51

94 316 GG 50 17 9.823 129 43 11.120

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.74	86	14143.38	3.32	12309.90	0.00	1830.16	1827.51	2.65	2.79			
3.58	77	27601.21	3.32	12308.94	13343.58	1945.37	1945.17	.20	.50	0.51	13458.34	13461.24
5.00	94	43969.97	3.32	12308.43	28927.37	2730.85	2726.23	4.62	3.05	0.99	29827.58	29826.09

94 316 R GG 50 17 10.004 129 43 20.780

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.74	86	14143.38	3.32	12309.90	0.00	1830.16	1828.10	2.06	2.79			
3.58	77	27601.21	3.32	12308.94	13343.58	1945.37	1945.05	.32	.50	0.51	13458.34	13460.53
5.00	94	43969.97	3.32	12308.43	28927.37	2730.85	2726.82	4.03	3.05	0.99	29827.58	29826.09

94 344 GG 50 15 29.210 129 50 12.372

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.71	86	14173.14	3.32	12309.90	0.00	1859.92	1857.22	2.70	2.77			
3.51	76	27607.19	3.32	12308.94	13343.58	1951.35	1950.96	.39	.44	0.51	13434.56	13437.32
3.82	86	43991.89	3.32	12308.43	28927.37	2752.77	2748.19	4.58	3.01	0.99	29819.74	29818.34

94 344 R GG 50 15 29.210 129 50 10.452

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.71	86	14173.14	3.32	12309.90	0.00	1859.92	1857.10	2.82	2.77			
3.51	76	27607.19	3.32	12308.94	13343.58	1951.35	1950.98	.37	.44	0.51	13434.56	13437.46
3.82	86	43991.89	3.32	12308.43	28927.37	2752.77	2748.07	4.70	3.01	0.99	29819.74	29818.34

94 5 0 GG 50 4 3.598 129 58 48.263

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.71	86	14233.07	3.34	12309.90	0.00	1919.83	1916.93	2.90	2.74			
3.53	77	27672.28	3.34	12308.94	13343.58	2016.42	2016.04	.38	.46	0.51	13439.72	13442.69
3.75	83	43998.08	3.34	12308.43	28927.37	2758.94	2755.01	3.93	2.84	0.99	29766.00	29765.45

94 5 0 R GG 50 4 3.658 129 59 .263

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.71	86	14233.07	3.34	12309.90	0.00	1919.83	1917.65	2.18	2.74			
3.53	77	27672.28	3.34	12308.94	13343.58	2016.42	2015.93	.49	.46	0.51	13439.72	13441.86
3.75	83	43998.08	3.34	12308.43	28927.37	2758.94	2755.76	3.18	2.84	0.99	29766.00	29765.48

94 532 BB INT 49 58 36.480 130 1 29.370

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.70	86	14256.68	3.34	12309.90	0.00	1943.44	1940.86	2.58	2.68			
3.52	77	27704.84	3.34	12308.94	13343.58	2048.98	2048.11	.87	.46	0.51	13448.67	13450.83
3.77	82	43996.00	3.34	12308.43	28927.37	2756.86	2753.81	3.05	2.70	0.99	29740.31	29740.32

94 650 BB 49 45 22.445 130 7 7.549

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.67	86	14312.54	3.36	12309.90	0.00	1999.28	1997.33	1.95	2.46			
3.45	78	27782.57	3.36	12308.94	13343.58	2126.69	2126.72	-.03	.48	0.51	13470.54	13472.97
3.72	82	43991.68	3.36	12308.43	28927.37	2752.52	2749.54	2.98	2.37	0.99	29680.13	29679.58

94 912 GG 49 40 48.187 130 8 52.796

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.70	87	14331.87	3.38	12309.90	0.00	2018.59	2016.66	1.93	2.58			
3.43	78	27810.35	3.38	12308.94	13343.58	2154.45	2154.06	.39	.46	0.51	13478.99	13480.98
3.78	82	43989.92	3.38	12308.43	28927.37	2750.74	2747.98	2.76	2.44	0.99	29659.04	29658.69

94 912 R GG 49 40 48.787 130 8 50.696

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.70	87	14331.87	3.38	12309.90	0.00	2018.59	2016.51	2.08	2.58			
3.43	78	27810.35	3.38	12308.94	13343.58	2154.45	2154.02	.43	.46	0.51	13478.99	13481.09
3.78	82	43989.92	3.38	12308.43	28927.37	2750.74	2747.87	2.87	2.44	0.99	29659.04	29658.73

94 11 0 R FF 49 38 44.947 130 9 29.460

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.71	86	14340.82	3.40	12309.90	0.00	2027.52	2024.80	2.72	2.60			
3.42	77	27822.47	3.40	12308.94	13343.58	2166.55	2166.44	.11	.46	0.51	13482.16	13485.22
3.76	82	43989.68	3.40	12308.43	28927.37	2750.48	2746.71	3.77	2.49	0.99	29649.85	29649.28

94 1256 GP 49 46 42.585 129 44 27.863

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.67	85	14227.67	3.43	12309.90	0.00	1914.34	1912.98	1.36	2.64			
3.48	78	27786.75	3.43	12308.94	13343.58	2130.80	2130.48	.32	.47	0.51	13559.59	13561.08
3.74	82	43907.07	3.43	12308.43	28927.37	2667.84	2665.61	2.23	2.32	0.99	29680.39	29680.00

94 1344 FF 49 51 1.472 129 30 3.038

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.71	86	14165.51	3.44	12309.90	0.00	1852.17	1849.46	2.71	2.70			
3.50	78	27770.07	3.44	12308.94	13343.58	2114.11	2113.53	.58	.63	0.51	13605.07	13607.65
3.74	81	43862.45	3.44	12308.43	28927.37	2623.21	2619.68	3.53	2.57	0.99	29697.93	29697.59

94 14 2 GG 49 52 36.568 129 24 37.663

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.C.
3.71	86	14141.77	3.44	12309.90	0.00	1828.43	1825.70	2.73	2.71			
3.47	78	27764.17	3.44	12308.94	13343.58	2108.21	2107.80	.41	.70	0.51	13622.91	13625.68
3.75	82	43845.59	3.44	12308.43	28927.37	2606.35	2602.58	3.77	2.80	0.99	29704.81	29704.25

94 1444 FF 49 55 50.116 129 11 48.598

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.C.
3.74	85	14086.39	3.45	12309.90	0.00	1773.04	1771.07	1.97	2.75			
3.47	78	27754.33	3.45	12308.94	13343.58	2098.36	2098.27	.09	.93	0.51	13668.45	13670.78
3.75	83	43804.49	3.45	12308.43	28927.37	2565.24	2561.54	3.70	2.87	0.99	29719.09	29717.84

94 1444 R FF 49 55 49.936 129 11 42.898

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.C.
3.74	85	14086.39	3.45	12309.90	0.00	1773.04	1770.74	2.30	2.75			
3.47	78	27754.33	3.45	12308.94	13343.58	2098.36	2098.37	-.01	.93	0.51	13668.45	13671.21
3.75	83	43804.49	3.45	12308.43	28927.37	2565.24	2561.17	4.07	2.87	0.99	29719.09	29717.80

94 1528 GB 49 59 14.046 128 59 36.731

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.69	85	14027.71	3.46	12309.90	0.00	0.00	0.00	0.00	0.00			
3.42	77	27746.34	3.46	12308.94	13343.58	2090.36	2088.37	1.99	1.03	0.51	0.00	0.00
3.75	84	43760.94	3.46	12308.43	28927.37	0.00	0.00	0.00	0.00	0.99	0.00	0.00

94 1550 GG 50 0 59.338 128 51 15.441

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.67	85	13999.00	3.46	12309.90	0.00	1685.64	1683.64	2.00	2.73			
3.41	77	27742.71	3.46	12308.94	13343.58	2086.73	2085.69	1.04	1.00	0.51	13744.22	13745.63
3.77	84	43740.11	3.46	12308.43	28927.37	2500.85	2497.14	3.71	3.05	0.99	29742.10	29740.87

94 1550 R GG 50 0 59.038 128 51 6.201

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.67	85	13999.00	3.46	12309.90	0.00	1685.64	1683.11	2.53	2.73			
3.41	77	27742.71	3.46	12308.94	13343.58	2086.73	2085.87	.86	1.00	0.51	13744.22	13746.34
3.77	84	43740.11	3.46	12308.43	28927.37	2500.85	2496.56	4.29	3.05	0.99	29742.10	29740.82

94 1718 FF 49 55 2.741 128 30 50.287

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.84	88	13946.24	3.48	12309.90	0.00	1632.86	1630.24	2.62	2.95			
3.46	80	27799.42	3.48	12308.94	13343.58	2143.42	2142.20	1.22	1.19	0.51	13853.69	13855.54
3.81	84	43651.28	3.48	12308.43	28927.37	2412.00	2407.73	4.27	3.09	0.99	29706.03	29704.86

94 1718 R FF 49 55 .700 128 30 47.408

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.84	88	13946.24	3.48	12309.90	0.00	1632.86	1630.18	2.68	2.95			
3.46	80	27799.42	3.48	12308.94	13343.58	2143.42	2142.45	.97	1.19	0.51	13853.69	13855.85
3.81	84	43651.28	3.48	12308.43	28927.37	2412.00	2407.47	4.53	3.09	0.99	29706.03	29704.66

94 1744 GG 49 52 14.676 128 25 25.222

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.81	88	13936.72	3.48	12309.90	0.00	1623.34	1620.43	2.91	3.01			
3.52	81	27822.35	3.48	12308.94	13343.58	2166.35	2164.81	1.54	1.16	0.51	13886.14	13887.96
3.82	84	43624.64	3.48	12308.43	28927.37	2385.36	2381.06	4.30	3.02	0.99	29688.91	29688.00

94 1744 R GG 49 52 12.636 128 25 22.882

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.81	88	13936.72	3.48	12309.90	0.00	1623.34	1620.40	2.94	3.01			
3.52	81	27822.35	3.48	12308.94	13343.58	2166.35	2165.05	1.30	1.16	0.51	13886.14	13888.23
3.82	84	43624.64	3.48	12308.43	28927.37	2385.36	2380.84	4.52	3.02	0.99	29688.91	29687.81

94 1932 BB INT 49 40 2.896 128 2 5.487

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.78	87	13899.08	3.50	12309.90	0.00	1585.68	1582.90	2.78	2.92			
3.54	82	27921.73	3.50	12308.94	13343.58	2265.71	2264.09	1.62	1.43	0.51	14023.16	14024.77
3.77	81	43509.23	3.50	12308.43	28927.37	2269.93	2265.85	4.08	2.98	0.99	29611.14	29610.32

94 2114 GG 49 28 2.937 127 40 46.347

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.79	87	13874.36	3.52	12309.90	0.00	1560.94	1558.43	2.51	2.71			
3.61	84	28018.98	3.52	12308.94	13343.58	2362.94	2361.34	1.60	1.57	0.51	14145.13	14146.49
3.74	78	43401.57	3.52	12308.43	28927.37	2162.25	2158.62	3.63	2.94	0.99	29528.20	29527.56

94 2114 R GG 49 28 3.057 127 40 42.867

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.79	87	13874.36	3.52	12309.90	0.00	1560.94	1558.24	2.70	2.71			
3.61	84	28018.98	3.52	12308.94	13343.58	2362.94	2361.41	1.53	1.57	0.51	14145.13	14146.75
3.74	78	43401.57	3.52	12308.43	28927.37	2162.25	2158.41	3.84	2.94	0.99	29528.20	29527.54

94 23 4 GG 49 15 4.417 127 16 32.313

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.81	87	13851.65	3.54	12309.90	0.00	1538.21	1536.54	1.67	2.78			
3.57	86	28128.17	3.54	12308.94	13343.58	2472.11	2469.53	2.58	1.79	0.51	14277.03	14276.57
3.75	79	43280.14	3.54	12308.43	28927.37	2040.80	2038.37	2.43	2.31	0.99	29429.48	29429.20

94 23 4 R GG 49 15 6.516 127 16 18.094

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.81	87	13851.65	3.54	12309.90	0.00	1538.21	1535.69	2.52	2.78			
3.57	86	28128.17	3.54	12308.94	13343.58	2472.11	2469.65	2.46	1.79	0.51	14277.03	14277.54
3.75	79	43280.14	3.54	12308.43	28927.37	2040.80	2037.55	3.25	2.31	0.99	29429.48	29429.23

95 0 2 FF 49 7 17.786 127 4 18.669

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.79	88	13849.39	3.55	12309.90	0.00	1535.94	1534.39	1.55	2.92			
3.59	88	28190.75	3.55	12308.94	13343.58	2534.68	2531.82	2.86	1.89	0.51	14341.87	14341.01
3.77	77	43216.56	3.55	12308.43	28927.37	1977.21	1975.15	2.06	2.40	0.99	29368.16	29368.13

95 0 2 R FF 49 7 21.386 127 3 58.510

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.79	88	13849.39	3.55	12309.90	0.00	1535.94	1533.17	2.77	2.92			
3.59	88	28190.75	3.55	12308.94	13343.58	2534.68	2531.95	2.73	1.89	0.51	14341.87	14342.36
3.77	77	43216.56	3.55	12308.43	28927.37	1977.21	1973.99	3.22	2.40	0.99	29368.16	29368.19

95 048 BB INT 49 1 33.077 126 53 35.139

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.79	87	13845.51	3.56	12309.90	0.00	1532.05	1529.94	2.11	2.87			
3.64	89	28239.52	3.56	12308.94	13343.58	2583.44	2580.50	2.94	2.19	0.51	14394.52	14394.14
3.72	75	43163.91	3.56	12308.43	28927.37	1924.55	1922.08	2.47	2.49	0.99	29319.39	29319.51

95 150 GG 48 54 21.664 126 38 48.137

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.77	86	13839.56	3.57	12309.90	0.00	1526.09	1523.41	2.68	2.78			
3.58	90	28303.06	3.57	12308.94	13343.58	2646.97	2643.84	3.13	2.61	0.51	14464.01	14464.01
3.75	75	43092.84	3.57	12308.43	28927.37	1853.47	1850.52	2.95	2.64	0.99	29254.27	29254.48

95 150 R GG 48 54 21.724 126 38 36.618

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.77	86	13839.56	3.57	12309.90	0.00	1526.09	1522.90	3.19	2.78			
3.58	90	28303.06	3.57	12308.94	13343.58	2646.97	2644.12	2.85	2.61	0.51	14464.01	14464.80
3.75	75	43092.84	3.57	12308.43	28927.37	1853.47	1849.78	3.69	2.64	0.99	29254.27	29254.25

95 210 FF 48 52 11.279 126 33 49.950

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.77	87	13837.46	3.58	12309.90	0.00	1523.98	1520.79	3.19	2.66			
3.61	91	28322.62	3.58	12308.94	13343.58	2666.52	2663.84	2.68	2.64	0.51	14485.67	14486.63
3.77	75	43070.25	3.58	12308.43	28927.37	1830.87	1826.95	3.92	2.65	0.99	29233.78	29233.53

95 210 R FF 48 52 10.320 126 33 59.430

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.77	87	13837.46	3.58	12309.90	0.00	1523.98	1521.28	2.70	2.66			
3.61	91	28322.62	3.58	12308.94	13343.58	2666.52	2663.69	2.83	2.64	0.51	14485.67	14485.99
3.77	75	43070.25	3.58	12308.43	28927.37	1830.87	1827.53	3.34	2.65	0.99	29233.78	29233.62

95 234 PP 48 49 44.875 126 28 21.584

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.74	86	13834.46	3.58	12309.90	0.00	1520.98	1518.55	2.43	2.75			
3.62	91	28345.53	3.58	12308.94	13343.58	2689.43	2686.22	3.21	2.60	0.51	14511.58	14511.25
4.11	103	43043.85	3.58	12308.43	28927.37	1804.47	1800.92	3.55	2.72	0.99	29210.38	29209.74

95 252 R FP 48 48 3.231 126 23 57.235

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.75	87	13831.98	3.59	12309.90	0.00	1518.49	1515.72	2.77	2.63			
3.63	93	28362.23	3.59	12308.94	13343.58	2706.12	2702.73	3.39	2.52	0.51	14530.76	14530.59
3.78	76	43023.05	3.59	12308.43	28927.37	1783.66	1780.49	3.17	2.75	0.99	29192.06	29192.14

95 422 GG 48 39 27.872 126 2 20.327

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.77	86	13823.53	3.60	12309.90	0.00	1510.03	1507.03	3.00	2.82			
3.73	96	28445.92	3.60	12308.94	13343.58	2789.80	2786.07	3.73	3.19	0.51	14622.90	14622.62
3.71	73	42923.00	3.60	12308.43	28927.37	1683.60	1679.72	3.88	3.20	0.99	29100.46	29100.06

95 422 R GG 48 39 27.872 126 2 20.327

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.77	86	13823.53	3.60	12309.90	0.00	1510.03	1507.03	3.00	2.82			
3.73	96	28445.92	3.60	12308.94	13343.58	2789.80	2786.07	3.73	3.19	0.51	14622.90	14622.62
3.71	73	42923.00	3.60	12308.43	28927.37	1683.60	1679.72	3.88	3.20	0.99	29100.46	29100.06

95 442 FF 48 37 37.289 125 57 42.599

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.79	87	13822.33	3.61	12309.90	0.00	1508.82	1506.01	2.81	2.78			
3.75	97	28464.40	3.61	12308.94	13343.58	2808.27	2804.08	4.19	3.24	0.51	14642.58	14641.65
3.74	76	42900.79	3.61	12308.43	28927.37	1661.38	1658.12	3.26	3.22	0.99	29079.45	29079.48

95 442 R FF 48 37 35.248 125 57 37.379

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.79	87	13822.33	3.61	12309.90	0.00	1508.82	1505.99	2.83	2.78			
3.75	97	28464.40	3.61	12308.94	13343.58	2808.27	2804.42	3.85	3.24	0.51	14642.58	14642.01
3.74	76	42900.79	3.61	12308.43	28927.37	1661.38	1657.71	3.67	3.22	0.99	29079.45	29079.09

95 540 FF 48 32 18.377 125 44 32.851

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.81	86	13821.25	3.62	12309.90	0.00	1507.73	1505.15	2.58	2.70			
3.79	100	28515.98	3.62	12308.94	13343.58	2859.84	2856.00	3.84	3.64	0.51	14695.24	14694.43
3.71	73	42839.89	3.62	12308.43	28927.37	1600.47	1596.57	3.90	3.38	0.99	29019.63	29018.79

95 10 4 GG 48 46 11.290 125 33 41.964

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.78	87	13725.16	3.67	12309.90	0.00	1411.59	1408.63	2.96	2.76			
3.82	106	28457.85	3.67	12308.94	13343.58	2801.66	2796.67	4.99	4.38	0.51	14733.20	14731.62
3.67	73	42825.56	3.67	12308.43	28927.37	1586.09	1583.47	2.62	2.49	0.99	29101.39	29102.21

95 10 4 R GG 48 46 12.130 125 33 41.244

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.78	87	13725.16	3.67	12309.90	0.00	1411.59	1408.53	3.06	2.76			
3.82	106	28457.85	3.67	12308.94	13343.58	2801.66	2796.62	5.04	4.38	0.51	14733.20	14731.67
3.67	73	42825.56	3.67	12308.43	28927.37	1586.09	1583.46	2.63	2.49	0.99	29101.39	29102.30

95 1026 PP INT 48 48 30.794 125 38 40.031

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.78	87	13723.39	3.67	12309.90	0.00	1409.82	1407.13	2.69	2.91			
3.82	105	28435.62	3.67	12308.94	13343.58	2779.43	2774.96	4.47	4.20	0.51	14712.74	14711.41
3.68	73	42849.80	3.67	12308.43	28927.37	1610.33	1607.64	2.69	2.47	0.99	29127.40	29127.88

95 1152 PP 48 56 46.050 125 58 2.962

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.79	88	13725.82	3.69	12309.90	0.00	1412.23	1409.21	3.02	2.95			
3.82	101	28355.74	3.69	12308.94	13343.58	2699.53	2695.30	4.23	3.87	0.51	14630.43	14629.67
3.71	74	42943.12	3.69	12308.43	28927.37	1703.63	1700.04	3.59	2.51	0.99	29218.29	29218.20

95 1152 R PP 48 56 46.350 125 58 9.622

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.79	88	13725.82	3.69	12309.90	0.00	1412.23	1409.45	2.78	2.95			
3.82	101	28355.74	3.69	12308.94	13343.58	2699.53	2695.08	4.45	3.87	0.51	14630.43	14629.21
3.71	74	42943.12	3.69	12308.43	28927.37	1703.63	1700.47	3.16	2.51	0.99	29218.29	29218.39

95 1212 FF 48 58 49.234 126 2 51.490

CYCLE	GAIN	OPS TOA	CLOCK RATE	CLOCK SYNCH	FMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MCN. CORR	OBS T.D.	CALC T.D.
3.78	87	13726.42	3.69	12309.90	0.00	1412.83	1410.60	2.23	2.88			
3.81	100	28336.28	3.69	12308.94	13343.58	2680.07	2675.63	4.44	3.83	0.51	14610.37	14608.61
3.70	75	42964.96	3.69	12308.43	28927.37	1725.47	1722.97	2.50	2.76	0.99	29239.53	29239.74

95 1212 R FF 48 58 52.654 126 2 37.090

CYCLE	GAIN	OBS TCA	CLCCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CCRR	OBS T.C.	CALC T.C.
3.78	87	13726.42	3.69	12309.90	0.00	1412.83	1409.73	3.10	2.88			
3.81	100	28336.28	3.69	12308.94	13343.58	2680.07	2675.71	4.36	3.83	0.51	14610.37	14609.56
3.70	75	42964.96	3.69	12308.43	28927.37	1725.47	1722.20	3.27	2.76	0.99	29239.53	29239.84

95 1314 FF 49 5 43.666 126 16 20.494

CYCLE	GAIN	OPS TCA	CLCCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.D.
3.80	88	13728.14	3.70	12309.90	0.00	1414.54	1410.83	3.71	2.76			
3.80	98	28274.12	3.70	12308.94	13343.58	2617.90	2614.25	3.65	3.49	0.51	14546.49	14547.00
3.73	76	43033.98	3.70	12308.43	28927.37	1794.48	1789.93	4.55	3.24	0.99	29306.83	29306.47

95 1314 R FF 49 5 38.746 126 16 36.274

CYCLE	GAIN	OBS TOA	CLCCK RATE	CLOCK SYNCH	FMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.80	88	13728.14	3.70	12309.90	0.00	1414.54	1411.91	2.63	2.76			
3.80	98	28274.12	3.70	12308.94	13343.58	2617.90	2614.28	3.62	3.49	0.51	14546.49	14545.95
3.73	76	43033.98	3.70	12308.43	28927.37	1794.48	1790.72	3.76	3.24	0.99	29306.83	29306.18

95 1354 GG 49 10 14.154 126 25 38.709

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.84	88	13731.01	3.71	12309.90	0.00	1417.40	1414.02	3.38	2.98			
3.80	95	28233.73	3.71	12308.94	13343.58	2577.50	2573.56	3.94	3.15	0.51	14503.23	14503.12
3.79	77	43079.25	3.71	12308.43	28927.37	1839.74	1835.52	4.22	3.19	0.99	29349.23	29348.87

95 1354 R GG 49 10 14.034 126 25 51.789

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.84	88	13731.01	3.71	12309.90	0.00	1417.40	1414.61	2.79	2.98			
3.80	95	28233.73	3.71	12308.94	13343.58	2577.50	2573.22	4.28	3.15	0.51	14503.23	14502.19
3.79	77	43079.25	3.71	12308.43	28927.37	1839.74	1836.33	3.41	3.19	0.99	29349.23	29349.09

95 1440 GG 49 15 12.663 126 36 59.020

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.85	88	13738.22	3.72	12309.90	0.00	1424.60	1422.14	2.46	3.00			
3.75	93	28187.53	3.72	12308.94	13343.58	2531.29	2527.20	4.09	2.77	0.51	14449.82	14448.64
3.78	77	43132.53	3.72	12308.43	28927.37	1893.01	1889.83	3.18	3.22	0.99	29395.30	29395.06

95 15 0 R FP 49 17 25.508 126 41 53.668

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.87	89	13741.56	3.72	12309.90	0.00	1427.94	1425.99	1.95	3.07			
3.79	93	28167.33	3.72	12308.94	13343.58	2511.09	2506.88	4.21	2.78	0.51	14426.28	14424.47
3.78	78	43155.67	3.72	12308.43	28927.37	1916.15	1913.48	2.67	3.21	0.99	29415.10	29414.86

95 1630 GG 49 28 43.944 127 1 5.853

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.88	89	13750.40	3.74	12309.90	0.00	1436.76	1433.46	3.30	3.06			
3.69	89	28071.80	3.74	12308.94	13343.58	2415.54	2412.76	2.78	2.84	0.51	14321.91	14322.88
3.77	82	43257.24	3.74	12308.43	28927.37	2017.70	2012.44	5.26	3.34	0.99	29507.83	29506.35

95 1630 R GG 49 28 46.404 127 1 9.212

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.88	89	13750.40	3.74	12309.90	0.00	1436.76	1433.46	3.30	3.06			
3.69	89	28071.80	3.74	12308.94	13343.58	2415.54	2412.44	3.10	2.84	0.51	14321.91	14322.56
3.77	82	43257.24	3.74	12308.43	28927.37	2017.70	2012.75	4.95	3.34	0.99	29507.83	29506.66

95 1648 PP 49 30 26.308 127 5 32.722

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.92	89	13756.35	3.74	12309.90	0.00	1442.71	1439.89	2.82	3.05			
3.78	89	28054.78	3.74	12308.94	13343.58	2398.52	2396.33	2.19	2.72	0.51	14298.94	14300.02
3.78	82	43278.01	3.74	12308.43	28927.37	2038.47	2033.10	5.37	3.32	0.99	29522.65	29520.58

95 1648 R PP 49 30 38.548 127 5 46.401

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.92	89	13756.35	3.74	12309.90	0.00	1442.71	1439.75	2.96	3.05			
3.78	89	28054.78	3.74	12308.94	13343.58	2398.52	2394.81	3.71	2.72	0.51	14298.94	14298.64
3.78	82	43278.01	3.74	12308.43	28927.37	2038.47	2034.45	4.02	3.32	0.99	29522.65	29522.07

95 2020 GG 49 51 45.003 127 47 43.947

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.84	88	13810.53	3.78	12309.90	0.00	1496.85	1494.59	2.26	2.99			
3.64	83	27872.04	3.78	12308.94	13343.58	2215.74	2213.54	2.20	1.82	0.51	14062.02	14062.53
4.10	88	43484.89	3.78	12308.43	28927.37	2245.31	2241.64	3.67	3.57	0.99	29675.35	29674.42

95 2020 R GG 49 51 44.703 127 47 33.927

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.84	88	13810.53	3.78	12309.90	0.00	1496.85	1494.05	2.80	2.99			
3.64	83	27872.04	3.78	12308.94	13343.58	2215.74	2213.79	1.95	1.82	0.51	14062.02	14063.32
4.10	88	43484.89	3.78	12308.43	28927.37	2245.31	2241.02	4.29	3.57	0.99	29675.35	29674.34

95 22 6 R PP 49 57 24.133 127 59 32.395

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.84	88	13832.00	3.80	12309.90	0.00	1518.30	1515.48	2.82	3.00			
3.64	83	27823.09	3.80	12308.94	13343.58	2166.77	2165.13	1.64	1.46	0.51	13991.60	13993.23
4.01	88	43543.07	3.80	12308.43	28927.37	2303.47	2299.12	4.35	3.67	0.99	29712.06	29711.01

95 2314 PP 49 47 46.499 127 42 46.423

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.61	87	13806.88	3.82	12309.90	0.00	1493.16	1491.97	1.19	2.92			
3.63	83	27900.85	3.82	12308.94	13343.58	2244.51	2243.33	1.18	1.67	0.51	14094.48	14094.94
4.11	87	43457.02	3.82	12308.43	28927.37	2217.40	2213.39	4.01	3.41	0.99	29651.13	29648.79

95 2314 R PP 49 47 59.759 127 42 30.823

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.61	87	13806.88	3.82	12309.90	0.00	1493.16	1490.33	2.83	2.92			
3.63	83	27900.85	3.82	12308.94	13343.58	2244.51	2242.39	2.12	1.67	0.51	14094.48	14095.64
4.11	87	43457.02	3.82	12308.43	28927.37	2217.40	2213.01	4.39	3.41	0.99	29651.13	29650.05

96 1 2 FF 49 34 15.215 127 13 51.540

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.92	88	13767.27	3.84	12309.90	0.00	1453.53	1450.06	3.47	3.07			
3.67	88	28021.04	3.84	12308.94	13343.58	2364.68	2362.14	2.54	2.41	0.51	14254.28	14255.66
3.87	84	43318.29	3.84	12308.43	28927.37	2078.65	2073.26	5.39	3.29	0.99	29552.01	29550.57

96 1 2 R FF 49 34 16.535 127 13 58.140

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.92	88	13767.27	3.84	12309.90	0.00	1453.53	1450.32	3.21	3.07			
3.67	88	28021.04	3.84	12308.94	13343.58	2364.68	2361.86	2.82	2.41	0.51	14254.28	14255.12
3.87	84	43318.29	3.84	12308.43	28927.37	2078.65	2073.72	4.93	3.29	0.99	29552.01	29550.77

96 2 2 GG 49 27 5.483 127 0 27.397

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TCA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.C.	CALC T.C.
3.89	87	13754.92	3.85	12309.90	0.00	1441.17	1438.35	2.82	3.00			
3.67	90	28082.95	3.85	12308.94	13343.58	2426.58	2423.15	3.43	2.70	0.51	14328.54	14328.38
3.85	81	43249.85	3.85	12308.43	28927.37	2010.20	2006.01	4.19	3.30	0.99	29495.92	29495.03

96 2 2 R GG 49 27 4.223 127 0 32.737

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.89	87	13754.92	3.85	12309.90	0.00	1441.17	1438.70	2.47	3.00			
3.67	90	28082.95	3.85	12308.94	13343.58	2426.58	2423.13	3.45	2.70	0.51	14328.54	14328.01
3.85	81	43249.85	3.85	12308.43	28927.37	2010.20	2006.28	3.92	3.30	0.99	29495.92	29494.95

96 248 GG 49 21 51.555 126 50 51.844

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.91	88	13748.85	3.86	12309.90	0.00	1435.09	1432.26	2.83	3.01			
3.65	91	28127.52	3.86	12308.94	13343.58	2471.14	2467.67	3.47	2.85	0.51	14379.18	14378.99
3.82	81	43201.41	3.86	12308.43	28927.37	1961.75	1957.61	4.14	3.23	0.99	29453.55	29452.72

96 248 R GG 49 21 51.555 126 50 55.743

CYCLE	GAIN	OBS TCA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.91	88	13748.85	3.86	12309.90	0.00	1435.09	1432.45	2.64	3.01			
3.65	91	28127.52	3.86	12308.94	13343.58	2471.14	2467.57	3.57	2.85	0.51	14379.18	14378.70
3.82	81	43201.41	3.86	12308.43	28927.37	1961.75	1957.85	3.90	3.23	0.99	29453.55	29452.77

96 332 FF 49 17 9.247 126 40 47.310

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.89	88	13741.39	3.87	12309.90	0.00	1427.62	1424.07	3.55	3.07			
3.72	94	28169.42	3.87	12308.94	13343.58	2513.03	2510.14	2.89	2.78	0.51	14428.54	14429.65
3.77	78	43153.59	3.87	12308.43	28927.37	1913.92	1908.70	5.22	3.21	0.99	29413.19	29412.00

96 348 FF 49 15 19.743 126 36 40.061

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.89	88	13738.00	3.87	12309.90	0.00	1424.23	1420.73	3.50	3.01			
3.74	94	28186.58	3.87	12308.94	13343.58	2530.19	2527.02	3.17	2.76	0.51	14449.09	14449.87
3.80	79	43133.49	3.87	12308.43	28927.37	1893.82	1888.93	4.89	3.20	0.99	29396.48	29395.57

96 348 R FF 49 15 22.323 126 36 48.820

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.89	88	13738.00	3.87	12309.90	0.00	1424.23	1420.94	3.29	3.01			
3.74	94	28186.58	3.87	12308.94	13343.58	2530.19	2526.54	3.65	2.76	0.51	14449.09	14449.18
3.80	79	43133.49	3.87	12308.43	28927.37	1893.82	1889.58	4.24	3.20	0.99	29396.48	29396.01

96 432 GG 49 9 41.753 126 25 20.171

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.88	88	13732.19	3.88	12309.90	0.00	1418.41	1415.71	2.70	2.97			
3.74	96	28237.50	3.88	12308.94	13343.58	2581.10	2577.12	3.98	3.14	0.51	14505.82	14504.99
3.80	77	43076.35	3.88	12308.43	28927.37	1836.67	1833.07	3.60	3.17	0.99	29345.15	29344.73

96 432 R GG 49 9 41.394 126 25 29.531

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.88	88	13732.19	3.88	12309.90	0.00	1418.41	1416.15	2.26	2.97			
3.74	96	28237.50	3.88	12308.94	13343.58	2581.10	2576.91	4.19	3.14	0.51	14505.82	14504.34
3.80	77	43076.35	3.88	12308.43	28927.37	1836.67	1833.64	3.03	3.17	0.99	29345.15	29344.86

96 520 PP 49 3 53.443 126 12 26.204

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.85	87	13726.83	3.89	12309.90	0.00	1413.04	1409.65	3.39	2.92			
3.79	99	28292.25	3.89	12308.94	13343.58	2635.84	2631.06	4.78	3.57	0.51	14565.93	14564.99
3.77	76	43013.75	3.89	12308.43	28927.37	1774.06	1770.91	3.15	3.16	0.99	29287.91	29288.63

9E 520 R PP 49 3 51.103 126 12 32.324

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.85	87	13726.83	3.89	12309.90	0.00	1413.04	1410.10	2.94	2.92			
3.79	99	28292.25	3.89	12308.94	13343.58	2635.84	2631.11	4.73	3.57	0.51	14565.93	14564.59
3.77	76	43013.75	3.89	12308.43	28927.37	1774.06	1771.20	2.86	3.16	0.99	29287.91	29288.47

9E 622 PP 48 56 7.948 125 55 30.448

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.83	87	13723.18	3.90	12309.90	0.00	1409.38	1406.36	3.02	2.98			
3.80	102	28364.87	3.90	12308.94	13343.58	2708.45	2703.18	5.27	3.89	0.51	14642.20	14640.40
3.72	75	42931.28	3.90	12308.43	28927.37	1691.58	1688.96	2.62	2.57	0.99	29209.09	29209.97

9E 622 R PP 48 56 3.448 125 55 18.268

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.83	87	13723.18	3.90	12309.90	0.00	1409.38	1406.26	3.12	2.98			
3.80	102	28364.87	3.90	12308.94	13343.58	2708.45	2703.95	4.50	3.89	0.51	14642.20	14641.27
3.72	75	42931.28	3.90	12308.43	28927.37	1691.58	1688.02	3.56	2.57	0.99	29209.09	29209.13

9E 910 R PP 48 35 24.709 125 8 32.907

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.75	86	13733.92	3.93	12309.90	0.00	1420.09	1416.88	3.21	2.91			
3.81	112	28562.47	3.93	12308.94	13343.58	2906.02	2901.78	4.24	4.32	0.51	14829.06	14828.48
3.78	71	42706.20	3.93	12308.43	28927.37	1466.47	1463.32	3.15	2.72	0.99	28973.27	28973.81

9E 1056 R FF 48 24 50.841 124 35 35.563

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.83	87	13739.25	3.95	12309.90	0.00	1425.40	1421.74	3.66	2.97			
3.82	117	28682.89	3.95	12308.94	13343.58	3026.42	3021.77	4.65	4.77	0.51	14944.15	14943.61
3.71	70	42556.50	3.95	12308.43	28927.37	1316.75	1313.45	3.30	2.93	0.99	28818.24	28819.08

9€ 1120 R FF 48 22 11.415 124 27 56.581

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.82	86	13743.93	3.96	12309.90	0.00	1430.07	1426.14	3.93	2.97			
3.82	117	28712.35	3.96	12308.94	13343.58	3055.87	3051.06	4.81	4.79	0.51	14968.93	14968.50
3.71	70	42521.92	3.96	12308.43	28927.37	1282.16	1278.16	4.00	3.01	0.99	28778.98	28779.39

9€ 1222 R PP 48 16 36.779 124 8 43.245

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.79	84	13752.14	3.97	12309.90	0.00	1438.27	1434.23	4.04	2.96			
3.82	118	28780.87	3.97	12308.94	13343.58	3124.38	3119.20	5.18	5.02	0.51	15029.24	15028.55
3.70	68	42435.33	3.97	12308.43	28927.37	1195.56	1191.77	3.79	3.21	0.99	28684.18	28684.91

9€ 13 6 R FF 48 12 59.028 123 54 58.455

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.75	82	13757.77	3.98	12309.90	0.00	1443.89	1440.76	3.13	2.80			
3.81	119	28828.21	3.98	12308.94	13343.58	3171.71	3166.44	5.27	5.07	0.51	15070.95	15069.26
3.65	67	42374.21	3.98	12308.43	28927.37	1134.43	1130.70	3.73	3.47	0.99	28617.43	28617.31

9€ 1356 FF 48 13 2.495 123 38 10.425

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.77	82	13742.00	3.98	12309.90	0.00	1428.12	1424.72	3.40	2.67			
3.87	120	28862.15	3.98	12308.94	13343.58	3205.65	3200.65	5.00	5.26	0.51	15120.66	15119.51
3.72	68	42309.60	3.98	12308.43	28927.37	1069.82	1066.18	3.64	3.09	0.99	28568.59	28568.83

9€ 1410 FF 48 13 51.031 123 33 35.451

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.77	81	13732.89	3.99	12309.90	0.00	1419.00	1416.03	2.97	2.74			
3.87	121	28867.42	3.99	12308.94	13343.58	3210.91	3205.90	5.01	5.38	0.51	15135.04	15133.45
3.67	67	42294.09	3.99	12308.43	28927.37	1054.30	1050.60	3.70	2.95	0.99	28562.19	28561.94

9E 1410 R FF 48 13 54.811 123 33 41.571

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.77	81	13732.89	3.99	12309.90	0.00	1419.00	1415.73	3.27	2.74			
3.87	121	28867.42	3.99	12308.94	13343.58	3210.91	3205.35	5.56	5.38	0.51	15135.04	15133.20
3.67	67	42294.09	3.99	12308.43	28927.37	1054.30	1051.14	3.16	2.95	0.99	28562.19	28562.78

9E 1538 FF 48 24 32.115 123 10 28.273

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.74	81	13651.49	4.00	12309.90	0.00	1337.59	1334.94	2.65	2.76			
3.84	127	28860.03	4.00	12308.94	13343.58	3203.51	3199.15	4.36	4.39	0.51	15209.05	15207.79
3.65	69	42237.49	4.00	12308.43	28927.37	997.69	993.60	4.09	2.91	0.99	28586.99	28586.03

9E 1558 R PP 48 27 59.234 123 9 52.928

CYCLE	GAIN	OBS TOA	CLOCK RATE	CLOCK SYNCH	EMISSION DELAY	CORR TOA	CALC TOA	OBS ASF	CALC ASF	MON. CORR	OBS T.D.	CALC T.D.
3.67	81	13628.93	4.01	12309.90	0.00	1315.02	1313.44	1.58	2.81			
3.83	127	28842.50	4.01	12308.94	13343.58	3185.97	3182.41	3.56	4.49	0.51	15214.08	15212.55
3.61	68	42245.78	4.01	12308.43	28927.37	1005.97	1001.98	3.99	2.87	0.99	28617.84	28615.91

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OCEANOGRAPHIC OBSERVATIONS AT OCEAN STATION P

9 September - 26 October 1977

Volume 85

by

Seakem Oceanography Ltd.

INSTITUTE OF OCEAN SCIENCES, PATRICIA BAY
Sidney, B.C.

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ABSTRACT

Physical, chemical and biological oceanographic observations are made from the weathership at Ocean Weather Station Papa, and between Esquimalt and Station Papa, on a routine continuing basis. Physical oceanography data only are shown, including surface observations and profiles obtained with bottle casts and conductivity-temperature-pressure instruments.

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INTRODUCTION

Canadian operation of Ocean Weather Station P (Latitude 50°00'N, Longitude 145°00'W) was inaugurated in December, 1950. The station is occupied primarily to make meteorological observations of the surface and upper air and to provide an air-sea rescue service. The station is manned by two vessels operated by the Marine Services Branch of the Ministry of Transport. They are the CCGS Vancouver and the CCGS Quadra. Each ship remains on station for a period of six weeks, and is then relieved by the alternate ship, thus maintaining a continuous watch.

Bathythermograph observations have been made at Station P since July 1952. A program of more extensive oceanographic observations commenced in August 1956. This was extended in April 1959, by the addition of a series of oceanographic stations along the route to and from Station P and Swiftsure Bank. These stations are known as Line P stations. The number of stations on Line P has been increased twice and now consists of twelve stations (Fig. 1). Bathythermograph observations and surface salinity sample collections, in addition to being made on Line P oceanographic stations, are also made at odd meridians at 40', i.e. 139°40'W, 141°40'W, etc. These stations are known as Line P BT stations. Data observed prior to 1968 have been indexed by Collins et al (1969).

The present record includes hydrographic, continuously sampled STP and surface salinity and temperature data collected from the CCGS Vancouver during the period 9 September to 26 October 1977.

All physical oceanographic data have been stored by the Canadian Oceanographic Data Centre (CODC), 615 Booth Street, Ottawa, Ontario, Canada. Requests for these data should be directed to CODC.

Biological and productivity data are published in the Manuscript Report series of the Fisheries Research Board of Canada (FRB), Pacific Biological Station, Nanaimo, British Columbia, Canada. Requests for these data should be directed to FRB.

Marine geochemical data are for the Ocean Chemistry Group, Ocean and Aquatic Sciences, Environment Canada, Institute of Ocean Sciences, P.O. Box 6000, Sidney, British Columbia, Canada, V8L 4B2.

PROGRAM OF OBSERVATION FROM CCGS VANCOUVER, 9 SEPTEMBER - 26 OCTOBER 1977 (P-77-7) (CODC Ref. No. 15-77-007)

Oceanographic observations were made by Mr. C. Jackson of Seakem Oceanography Ltd., Sidney, B.C.

En Route to Station P

Line P Stations 1 to 3 and 6 to 12 were occupied and an STP profile made to near bottom or 1500 metres. One hydrocast was made at Station 7 to 1500 metres. Rough weather cancelled work on Stations 4 and 5. Lack of time cancelled the second scheduled hydrocast.

Samples for nitrates, nutrients, alkalinity and total CO_2 were collected at all whole stations from either a bucket or the seawater loop. Loop salinities were collected at whole and half stations 1 to 3 and 6 to 12½. Bucket salinity samples were collected at Stations 1 to 5½ and 7. Surface bucket temperatures were taken at all whole and half stations.

A surface tarball tow was made at Station 12.

The thermosalinograph, surface temperature recorder and PCO_2 system were run continuously (thermosalinograph when weather permitted).

Mechanical BT's or XBT's were taken at all whole and half stations.

On Station P

The oceanographic program was carried out as follows:

Physical Oceanography:

1) Profiles for salinity, temperature and oxygen were obtained from 6 hydrocasts to 4200 metres.

2) Thirty-nine STP profiles to 1500 metres (or near bottom) were obtained.

3) BT's were taken every 3 hours to coincide with meteorological observations and encoded and transmitted according to the IGOSS format. XBT's were taken on 2 days of rough weather. Two days of extremely rough weather cancelled XBT's.

4) Salinity samples were collected daily at 0000 hrs GMT from either the seawater loop or a bucket.

5) Twenty-six extra STP profiles were obtained to 300 metres from triangle grids set up by Cruise 15-77-006.

Marine Geochemistry:

1) Nutrient and salinity samples were collected daily at 0000 hrs GMT from either a bucket or the seawater loop, except for 4 days when the ship was off station on a triangle grid run. A 24-hour series for nutrients was also completed, with a sample taken every hour. One profile for nutrients and tritium to 500 metres was taken. One bucket sample for tritium and 7 rainwater samples for Pb^{210} were collected.

2) Alkalinity and total CO_2 samples were collected about every three days from a bucket or the seawater loop. Two profiles each to 500 metres were taken.

3) Air CO_2 samples were taken in duplicate on Sundays and Thursdays. No samples were taken for Scripps as no flasks were put on board.

4) Five surface tarball tows were completed.

5) PCO_2 carboys were filled in duplicate every week.

6) Two samples each of seawater C-14, seawater C-13 and air C-13 were collected.

Biological Oceanography:

Samples were obtained as follows:

1) Thirty-four 150 metre vertical plankton hauls.
Two 1200 metre vertical plankton hauls.
Three groups of subsurface plankton hauls were taken on 3 consecutive nights at sunset.

2) Six Secchi disc readings taken at local noon.

3) Two profiles to 200 metres for each of plant pigment and nitrate were obtained, as well as 4 surface samples each.

4) Two profiles to 500 metres for chlorophyll a were obtained.

En Route from Station P

Line P Stations 2 and 1 were occupied and an STP profile made to near bottom. No hydrocasts were made. Very rough weather cancelled all other scheduled STP's and hydrocasts.

Samples for nutrients, nitrates, alkalinity and total CO_2 were collected at Stations 11 and 6 to 1 from either a bucket or the seawater loop. Loop salinity samples were collected at Stations 12½ and 2 to 1. Bucket salinity samples were collected at Stations 11, 6, and 5½ to 1. Surface bucket temperatures were taken at Stations 12½, 11 and 6 to 1.

Surface tarball tows were made at Stations 2 and 1.

The surface temperature recorder and PCO_2 system were run continuously. The thermosalinograph was run from Station 2 inbound. The loop had been malfunctioning.

Mechanical BT's or XBT's were taken at Stations 12½ and 5½ to 1. Rough weather prevented outside work on other stations.

Observations for Other Agencies

1) Marine mammal observations were made by the ship's officers for Mr. I. McAskie, Fisheries Research Board of Canada, Pacific Biological Station, Nanaimo, British Columbia, Canada.

2) Bird observations were made by the ship's officers for Dr. M. Myres, University of Alberta, Calgary, Alberta, Canada and Mr. J. Guiguet, Curator of Birds and Mammals, Provincial Museum, Department of Provincial Secretary and Travel Industry, Victoria, British Columbia, Canada.

Data were processed for publication by Ms. M. Sainsbury of Seakem Oceanography Ltd., Sidney, B.C.

OBSERVATIONAL PROCEDURES

Observations for salinity, oxygen and temperature from all hydrographic casts, including the surface, were obtained with Niskin water sample bottles equipped with either Richter and Wiese and/or Yoshino Keiki Co. reversing thermometers. Two protected thermometers were used on all bottles and one unprotected thermometer was used on each bottle at depths of 300 m or greater. The accuracy of protected reversing thermometers is believed to be $\pm$ 0.02°C.

The daily surface water temperatures were measured from a bucket sample using a deck thermometer of $\pm$ 0.1°C accuracy. The daily surface salinity samples were obtained from the seawater loop. When the seawater loop was not operational these samples were obtained with a bucket, and are indicated with a 'b' in this data record.

Salinity determinations were made aboard ship with either an Autolab Model 601 Mark III inductive salinometer or a Hytech Model 6220 lab salinometer. Accuracy using duplicate determinations is estimated to be $\pm$ 0.003 °/oo.

Depth determinations were made using the "depth difference" method described in the U.S.N. Hydrographic Office Publication No. 607 (1955). Depth estimates have an approximate accuracy of $\pm$ 5 m for depths less than 1000 m, and $\pm$ 0.5% of depth for depths greater than 1000 m.

The dissolved oxygen analyses were done in shipboard laboratory by a modified Winkler method (Carpenter, 1955).

Line P engine intake continuous temperature on both ships was recorded by a Honeywell Electronik 15 Recorder. The temperature probe is at a depth of approximately 3 metres below the sea surface and the instrument accuracy is believed to be $\pm$ 0.1°C.

Each ship is equipped with a Plessey Model 6600-T thermosalinograph which is used on Line P, for continuous recording of surface temperatures and salinities from the ship's seawater loop. The temperature probe is mounted at the seawater loop intake (approximately 3 metres below the surface) and the salinity probe and recorder are situated in the dry lab. The accuracy of this instrument is believed to be ±0.1°C for temperature and ±0.1 °/oo for salinity.

STP profiles were taken with a Guildline Model 8700 STP system.

COMPUTATIONS

All hydrographic data were processed with the aid of an IBM 370 computer and a UNIVAC 1100 computer. Reversing thermometer temperature corrections, thermometric depth calculations and accepted depth from the "depth difference" method were computed. Extraneous thermometric depths caused by thermometer malfunctions were automatically edited and replaced. A Calcomp 565 Offline Plotter was used to plot temperature-salinity and temperature-oxygen diagrams, as well as plots of temperature, salinity and dissolved oxygen vs $\log_{10}$depth. These plots were used to check the data for errors.

Missing hydrographic data were obtained using a weighted parabolas interpolation method (Reiniger and Ross, 1968). These data are indicated with an asterisk in this data record.

Data values which we suspect but which we have included in this data record are indicated with a plus. These data have been removed from punch card and magnetic tape records.

Analog records from the salinity-temperature-pressure instrument have been machine digitized, then replotted using the Calcomp plotter.

Digitization was continued until original and computer plotted traces were coincident. Temperature values were listed at standard pressures. A malfunction in the salinity sensor resulted in inconsistant data. Hence, all STP salinity profiles have been omitted.

The headings for the data listings are explained as follows:

PRESS	is pressure (decibars)
TEMP	is temperature (degrees Celsius)
SAL	is salinity (parts per thousand)
DEPTH	is reported in metres
SIGMA-T	is specific gravity anomaly
SVA	is specific volume anomaly
THETA	is potential temperature (degrees Celsius)
SVA (THETA)	is potential specific volume anomaly
DELTA D	is geopotential anomaly (J/kg)
POT EN	is potential energy in units of 10^8 ergs/cm^2
OXY	is the concentration of dissolved oxygen expressed in millilitres per litre
SOUND	is the velocity of sound in m/sec

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Carpenter, J.H., 1965. The Chesapeake Bay Institute technique for the Winkler dissolved oxygen method. Limnol. and Oceanogr. 10: 141-143.

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MacNeill, M., 1977. A study of anomalous salinity and oxygen values in the deep water at Ocean Station P from 1960-1976 (unpublished manuscript). Pacific Marine Science Report 77-9.

Reiniger, R.F. and C.K. Ross, 1968. A method of interpolation with application to oceanographic data. Deep Sea Res. 15: 185-193.

U. S. N. Hydrographic Office, 1955. Instruction Manual for oceanographic observations. Publ. No. 607.

LOG OF HYDROGRAPHIC AND STP OBSERVATIONS

CONSEC. #	STATION	DATE (GMT)	TIME (GMT)	STP (m)	HYDROCAST (m)	COMMENTS
001	125-33°W	10/09/77	0000	75		
002	126-00°W	10/09/77	0145	65		
003	126-40°W	10/09/77	0405	1,100		
004	130-40°W	10/09/77	1555	1,500		
005	132-40°W	10/09/77	2158	1,500		
006	132-40°W	10/09/77	2342	-	1,500	T, S
007	134-40°W	11/09/77	0638	1,500		
008	136-40°W	11/09/77	1240	1,500		
009	138-40°W	11/09/77	1904	1,500		
010	140-40°W	12/09/77	0044	1,500		
011	142-40°W	12/09/77	0950	1,500		
012	P	12/09/77	2147	1,500		Niskin bottle check
013	P	12/09/77	2351	-	4,200	T, S, O_2
014	P	13/09/77	1722	1,500		
015	W3	13/09/77	1924	300		MILE grid
016	W4	13/09/77	2119	300		
017	C1	13/09/77	2238	300		
018	E4	14/09/77	0108	300		
019	E3	14/09/77	0310	300		
020	P	14/09/77	1711	1,500		
021	P	15/09/77	1717	1,500		Niskin bottle check
022	P	16/09/77	1736	1,500		
023	P	17/09/77	1709	1,500		
024	P	18/09/77	1710	1,500		
025	P	19/09/77	1712	1,500		
026	P	19/09/77	1834	-	4,200	T, S, O_2 & Alk.
027	P	20/09/77	1728	1,500		
028	W3	20/09/77	1943	300		MILE grid
029	W4	20/09/77	2224	300		
030	C1	21/09/77	0040	300		
031	E4	21/09/77	0245	300		
032	E3	21/09/77	0441	300		
033	P	21/09/77	1713	1,500		
034	P	22/09/77	1720	1,500		
035	P	23/09/77	1713	1,500		
036	P	24/09/77	1725	1,500		
037	P	25/09/77	1712	1,500		Niskin bottle check
038	P	26/09/77	1710	1,500		
039	P	26/09/77	1859	-	4,200	T, S, O_2, Alk. Total CO_2
040	P	27/09/77	1714	1,500		
041	W3	27/09/77	1942	300		MILE grid
042	W4	27/09/77	2211	300		

LOG OF HYDROGRAPHIC AND STP OBSERVATIONS (Continued)

CONSEC. #	STATION	DATE (GMT)	TIME (GMT)	STP (m)	HYDROCAST (m)	COMMENTS
043	C1	28/09/77	0018	300		
044	E4	28/09/77	0237	300		
045	E3	28/09/77	0433	300		
046	P	28/09/77	1721	1,500		
047	P	29/09/77	1739	1,500		
048	P	30/09/77	1720	1,500		
049	P	01/10/77	1710	1,500		Niskin bottle check
050	P	02/10/77	1723			
051	P	03/10/77	1711	1,500		
052	P	03/10/77	1914	-	4,200	T, S, O_2, trit. & nutrients
053	P	04/10/77	1709	1,500		
054	W3	04/10/77	1958	300		Niskin bottle check
055	W4	04/10/77	2238	300		MILE grid
056	C1	05/10/77	0040	300		
057	E4	05/10/77	0235	300		
058	E3	05/10/77	0431	300		
059	P	05/10/77	1714	1,500		
060	P	06/10/77	1713	1,500		
061	P	07/10/77	1740	1,500		
062	P	08/10/77	1716	1,500		Niskin bottle check
063	P	09/10/77	1730	1,500		
064	P	09/10/77	1936	-	4,200	T, S, O_2, Alk. Total CO_2
065	P	10/10/77	1744	1,500		
066	P	11/10/77	1723	1,500		
067	W3	11/10/77	2115	1,500		
068	P	12/10/77	1740	1,500		
069	P	13/10/77	1720	1,500		
070	P	15/10/77	1951	100		
071	P	17/10/77	1724	1,500		
072	P	18/10/77	1729	1,500		
073	P	18/10/77	1847	-	4,200	T, S, O_2
074	P	19/10/77	1715	1,500		
075	W3	19/10/77	2055	300		MILE grid
076	W4	20/10/77	0005	300		
077	C1	20/10/77	0202	300		Niskin bottle check
078	E4	20/10/77	0359	300		
079	E3	20/10/77	0558	300		
080	P	20/10/77	1743	1,500		
081	P	21/10/77	1718	1,500		
082	P	23/10/77	1712	1,500		
083	126-00°W	26/10/77	0754	90		Niskin bottle check
084	125-33°W	26/10/77	0954	110		

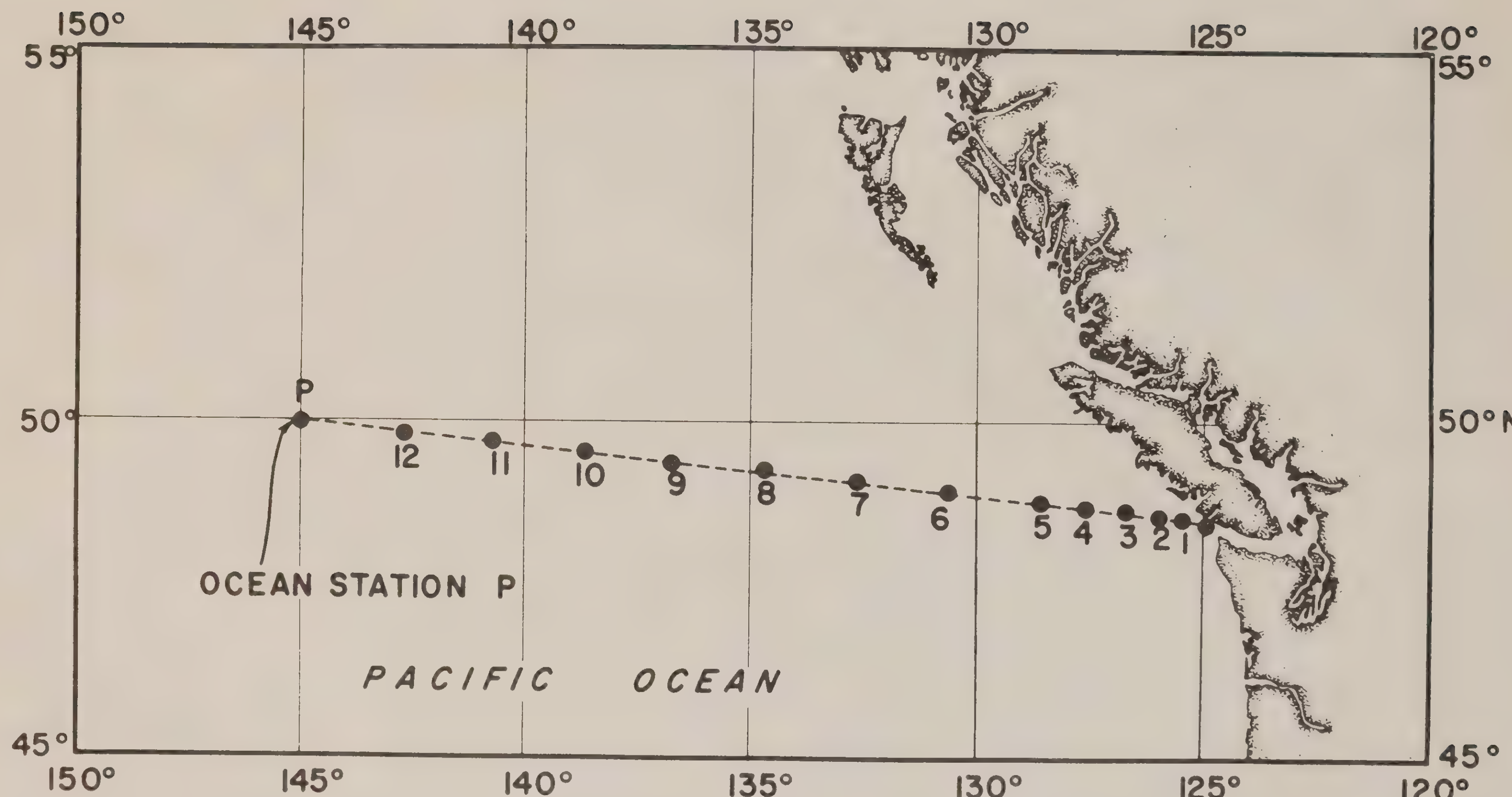


Fig. 1 Chart showing Line P station positions.

Oceanographic Data Obtained on Cruise P-77-7

(CODC Reference No. 15-77-007)

Results of Hydrographic Observations

(P-77-7)

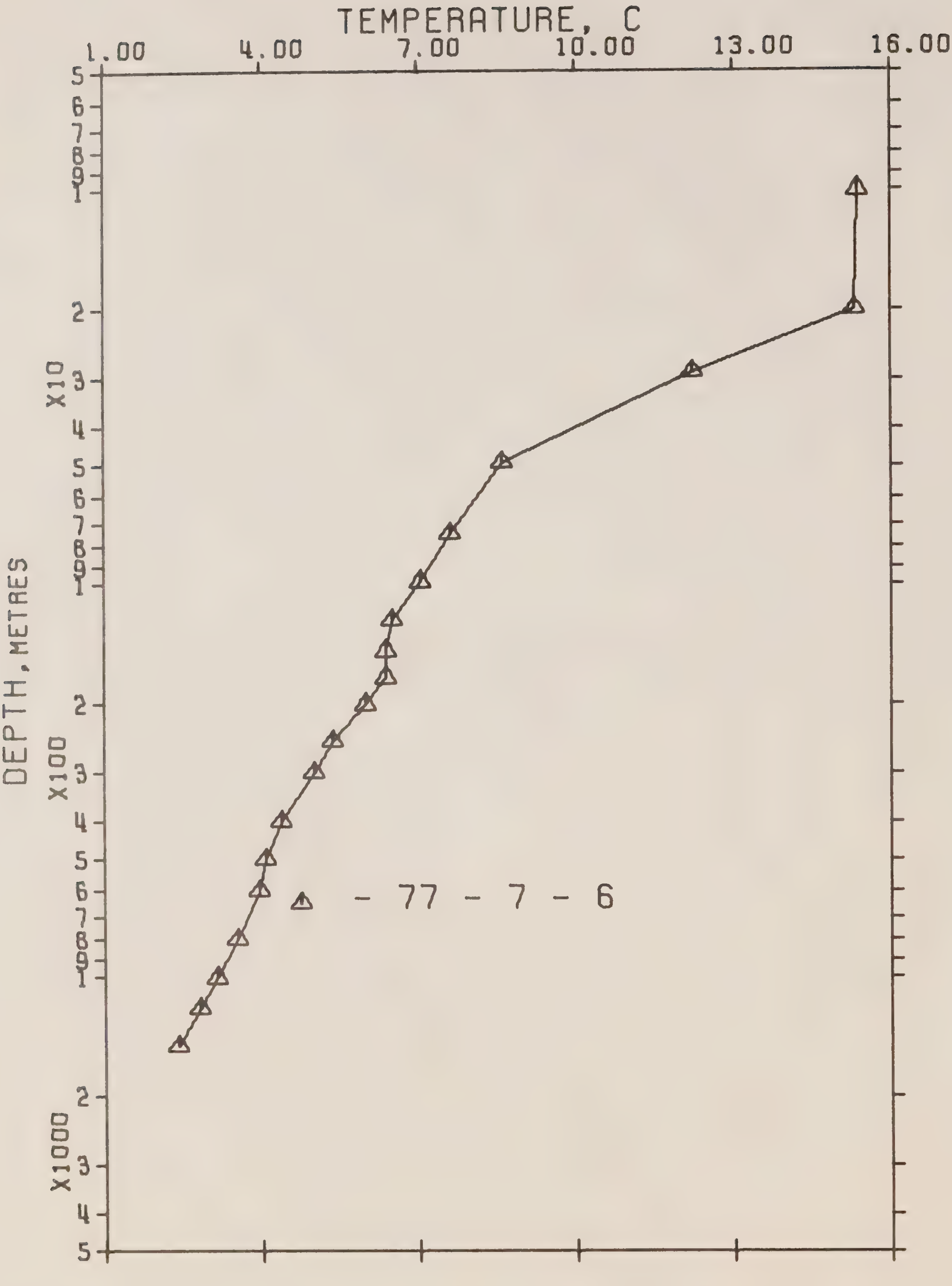


Figure 2. Composite plot of temperature vs $\log_{10}$ depth for Line P stations. P-77-7.

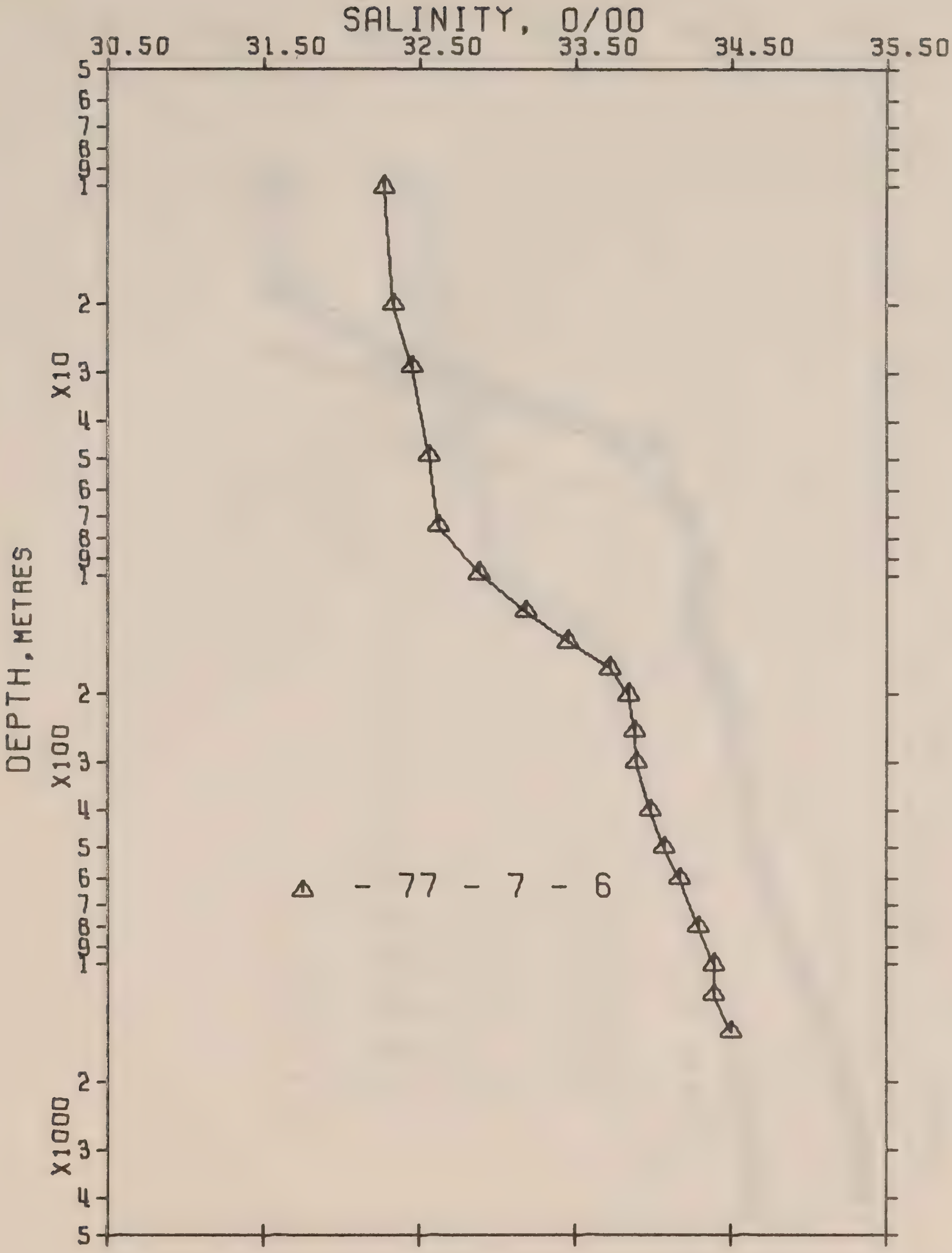


Figure 3. Composite plot of salinity vs $\log_{10}$ depth for Line P stations. P-77-7.

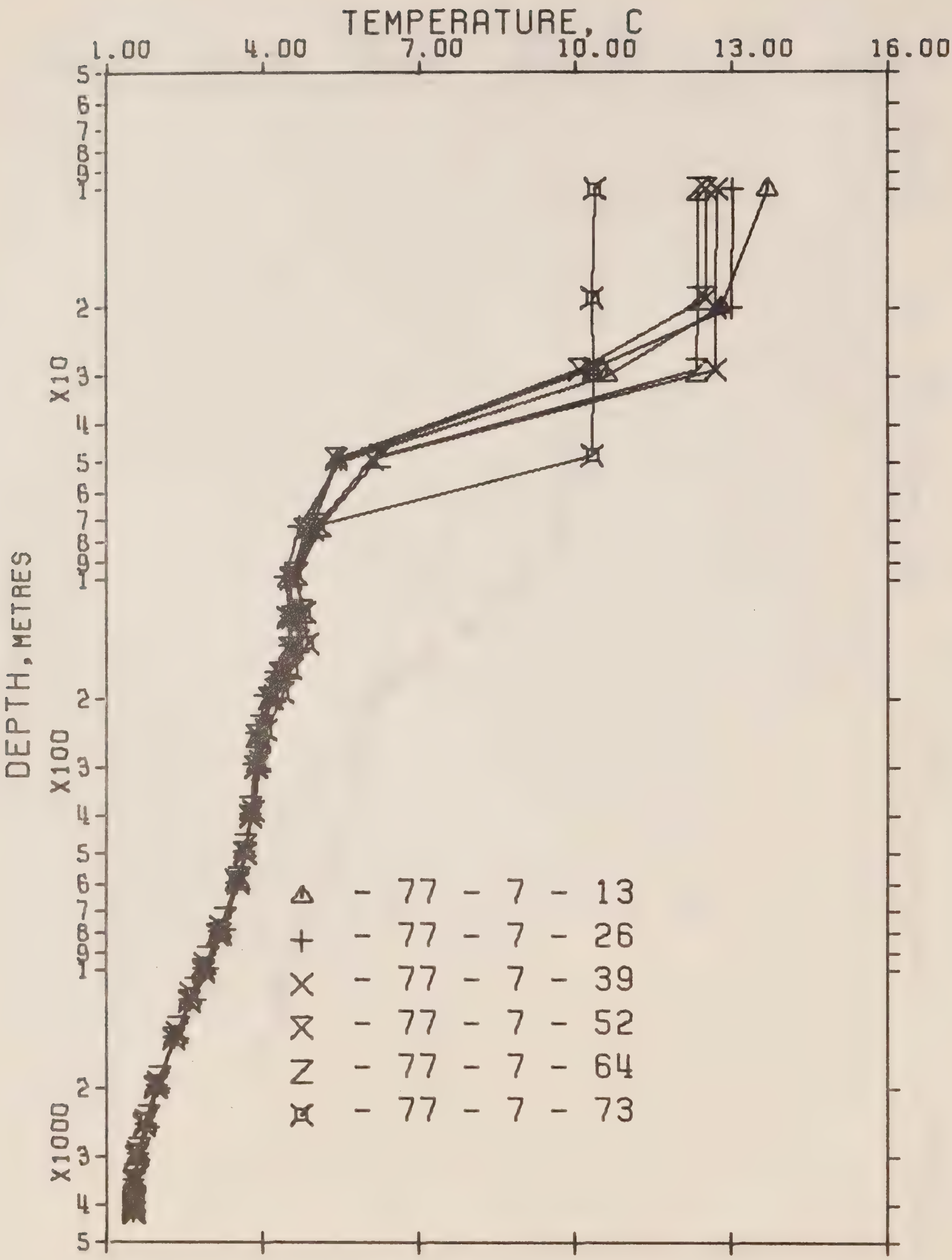


Figure 4. Composite plot of temperature vs $\log_{10}$ depth for Station P. P-77-7.

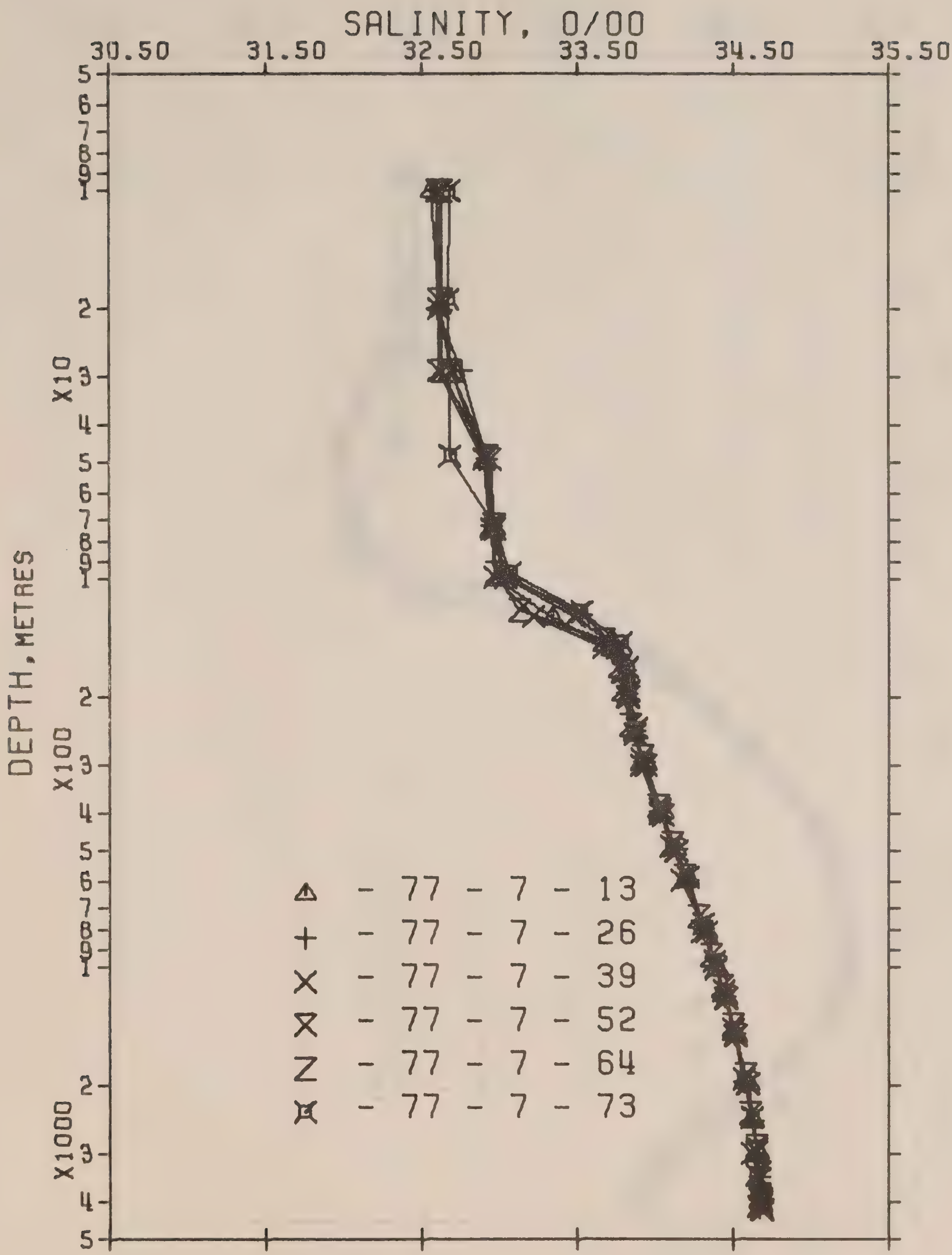


Figure 5. Composite plot of salinity vs $\log_{10}$ depth for Station P. P-77-7.

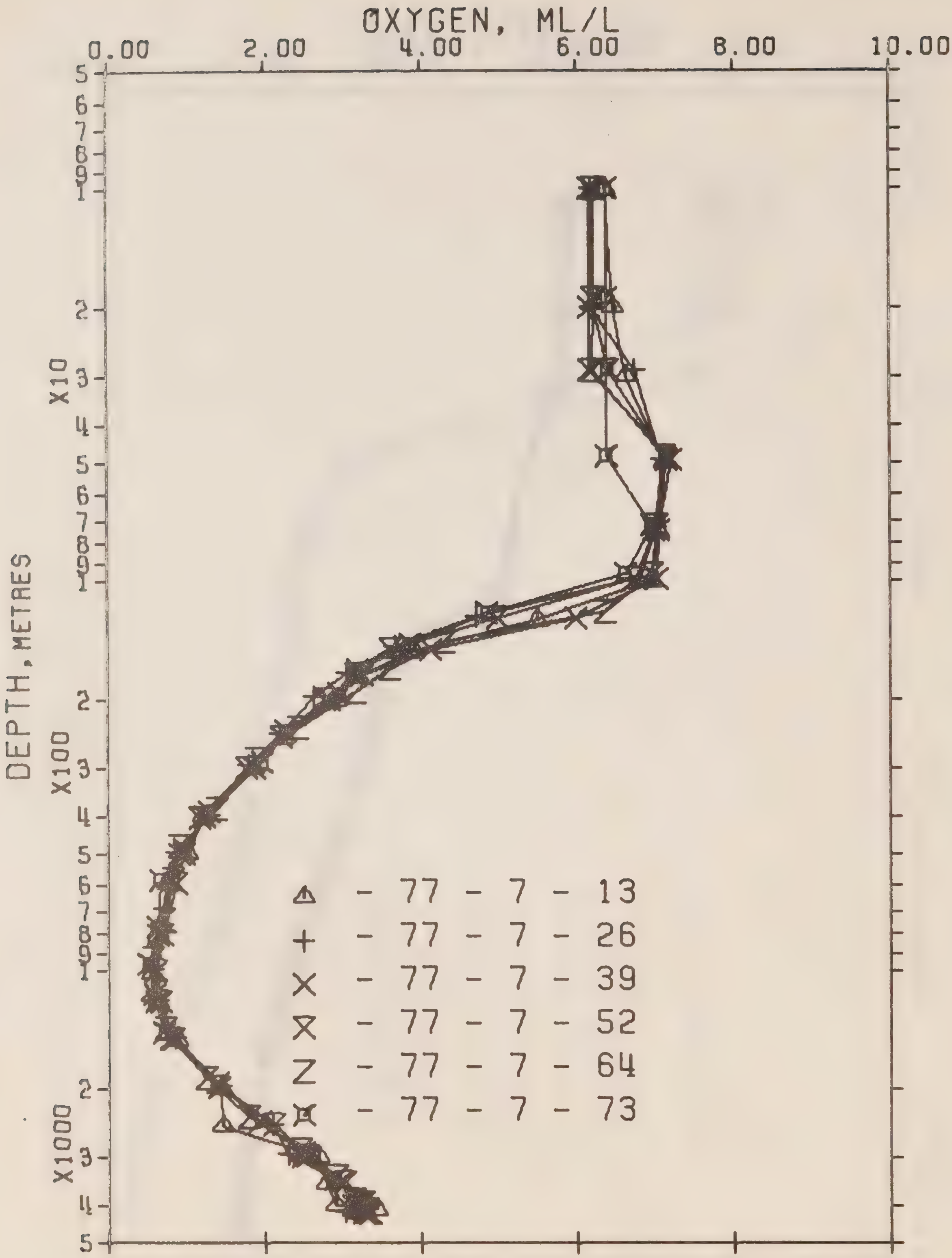
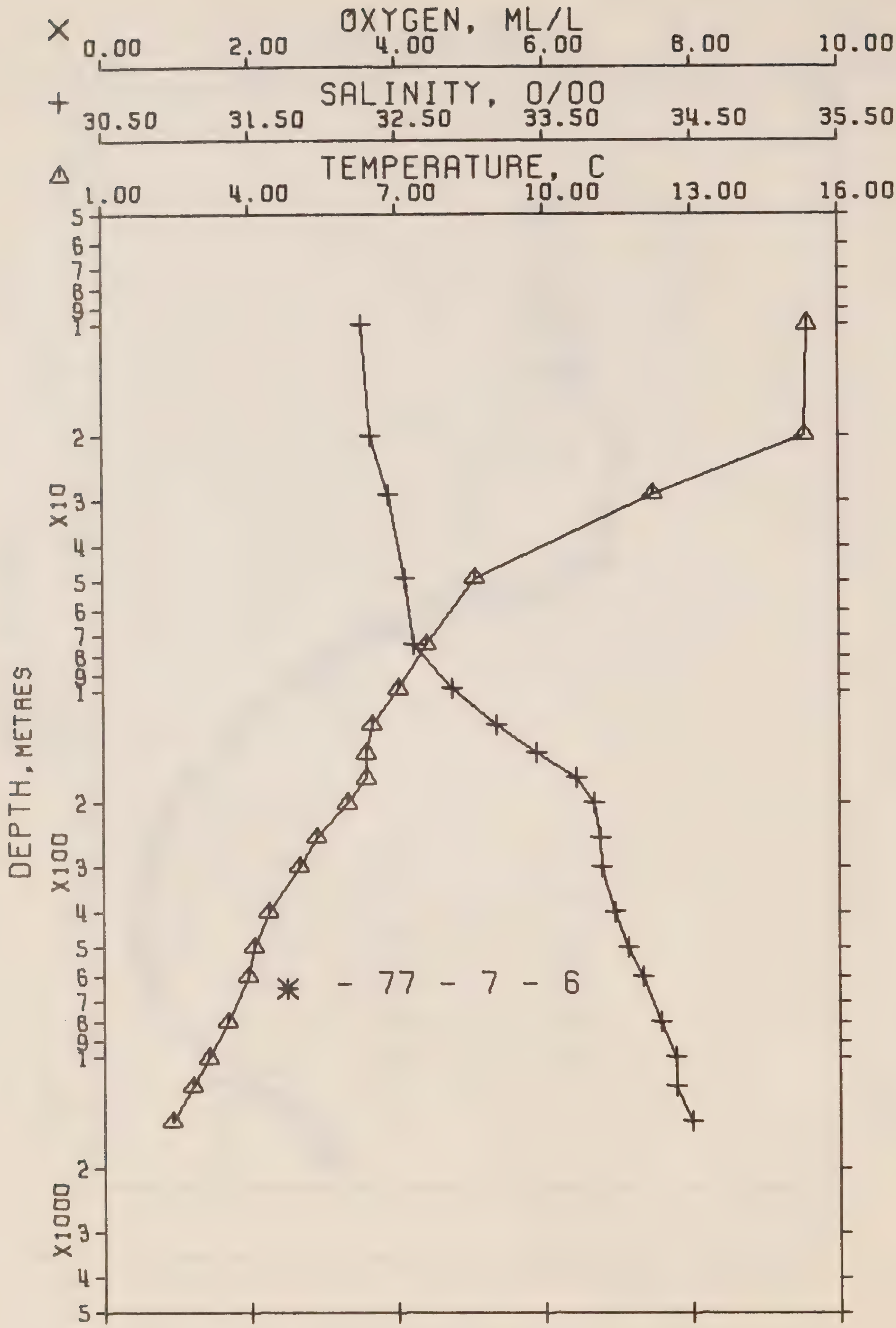


Figure 6. Composite plot of oxygen vs $\log_{10}$ depth for Station P. P-77-7.



OXYGEN, ML/L
0.00
2.00
4.00
6.00
8.00
10.00
SALINITY, 0/00
30.50
31.50
32.50
33.50
34.50
35.50
TEMPERATURE, C
1.00
4.00
7.00
10.00
13.00
16.00
DEPTH, METRES
X10
X100
X1000
* - 77 - 7 - 6

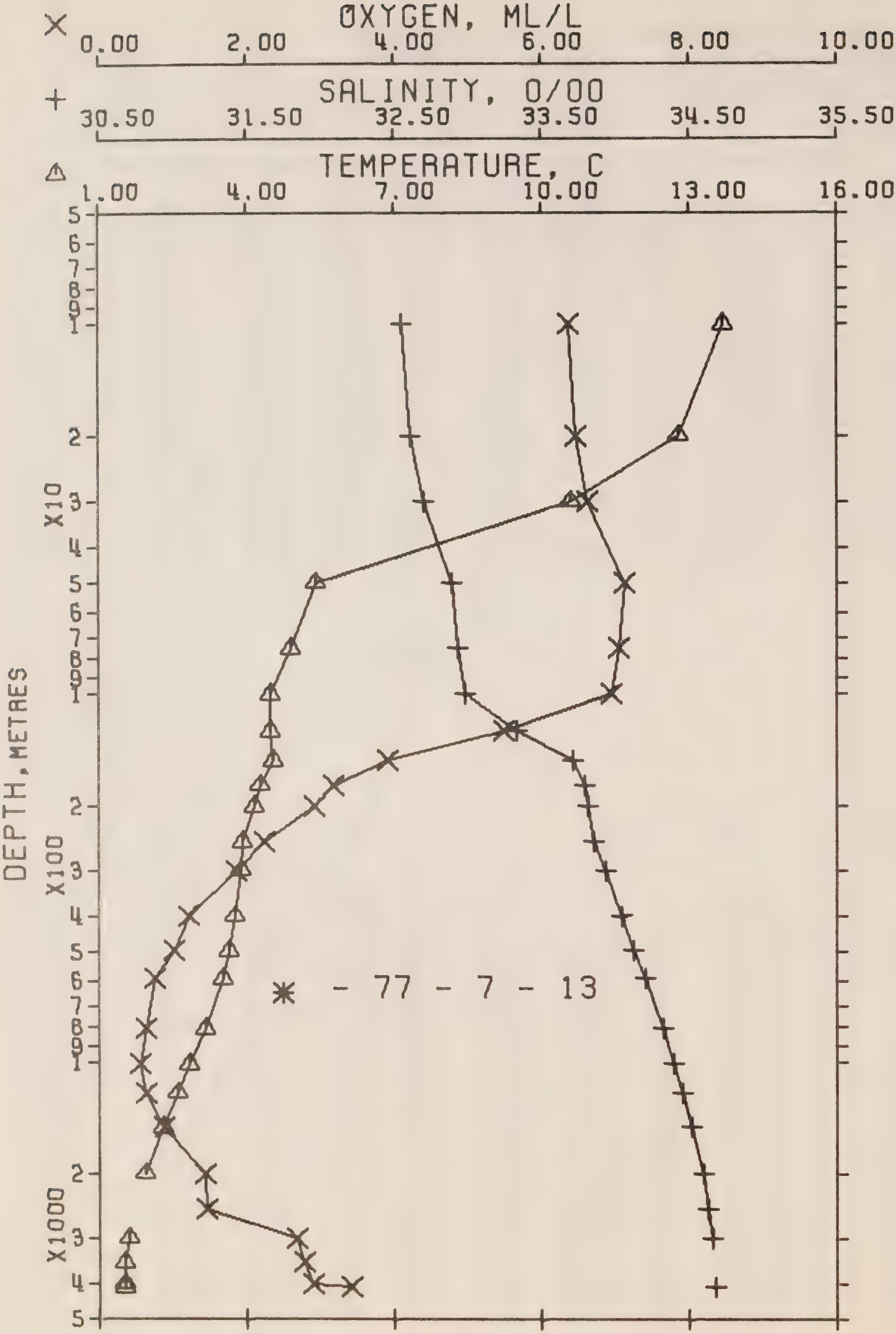
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 6 DATE 10/ 9/77 GMT 23.7
POSITION 49-10.0 N, 132-40.0 W STATION 7
HYDROGRAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	15.43	32.275	0	23.804	410.6	15.43	410.6	.00	.00		1505.
10	15.37	32.272	10	23.815	409.9	15.37	409.6	.41	.02		1505.
20	15.32	32.334	20	23.873	404.6	15.32	404.0	.83	.09		1505.
29	12.21	32.450	29	24.595	335.9	12.21	335.2	1.16	.17		1495.
49	8.60	32.563	49	25.297	269.2	8.59	268.3	1.77	.41		1483.
74	7.61	32.621	74	25.487	251.4	7.60	250.2	2.43	.82		1480.
99	7.02	32.885	98	25.775	224.3	7.01	222.8	3.00	1.33		1478.
124	6.49	33.179	123	26.076	195.9	6.48	194.2	3.53	1.93		1477.
148	6.38	33.454	147	26.307	174.4	6.37	172.3	3.98	2.54		1477.
173	6.36	33.719	172	26.518	154.7	6.34	152.2	4.39	3.22		1478.
202	5.99	33.844	201	26.664	141.1	5.97	138.4	4.82	4.05		1477.
252	5.34	33.878	250	26.770	131.4	5.32	128.3	5.49	5.60		1475.
302	4.98	33.892	300	26.823	126.7	4.96	123.2	6.14	7.43		1474.
402	4.37	33.976	399	26.956	114.5	4.34	110.5	7.35	11.76		1474.
503	4.05	34.066	499	27.061	105.2	4.01	100.5	8.46	16.87		1474.
604	3.95	34.170	599	27.154	97.2	3.91	91.6	9.48	22.63		1475.
806	3.53	34.295	799	27.295	84.9	3.47	78.2	11.31	35.77		1477.
1009	3.12	34.392	999	27.411	74.6	3.05	67.1	12.92	50.64		1479.
1210	2.80	34.392	1198	27.440	72.2	2.72	64.2	14.39	67.21		1481.
1510	2.38	34.498	1494	27.561	61.3	2.28	52.7	16.41	95.24		1484.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	15.43	32.275	0	23.804	410.6	15.43	410.6	.00	.00		1505.
10	15.37	32.272	10	23.815	409.9	15.37	409.6	.41	.02		1505.
20	15.32	32.334	20	23.873	404.6	15.32	404.0	.83	.09		1505.
30	12.01	32.456	30	24.637	331.9	12.01	331.1	1.19	.18		1495.
50	8.56	32.565	50	25.304	268.5	8.56	267.7	1.79	.42		1483.
75	7.59	32.629	75	25.495	250.6	7.59	249.4	2.44	.83		1479.
100	6.99	32.904	99	25.795	222.4	6.98	221.0	3.03	1.36		1478.
125	6.48	33.195	124	26.090	194.7	6.47	192.9	3.55	1.96		1477.
150	6.38	33.478	149	26.326	172.6	6.36	170.5	4.01	2.60		1477.
175	6.33	33.728	174	26.528	153.7	6.32	151.2	4.42	3.27		1478.
200	6.02	33.835	199	26.653	142.1	6.00	139.4	4.79	3.98		1477.
225	5.67	33.861	223	26.716	136.3	5.66	133.4	5.14	4.73		1476.
250	5.36	33.877	248	26.766	131.7	5.34	128.6	5.47	5.54		1475.
300	4.99	33.891	298	26.821	126.9	4.97	123.4	6.12	7.35		1474.
400	4.38	33.975	397	26.954	114.8	4.35	110.7	7.33	11.66		1474.
500	4.06	34.064	496	27.059	105.5	4.02	100.8	8.43	16.71		1474.
600	3.95	34.166	595	27.151	97.5	3.91	92.0	9.44	22.39		1475.
700	3.74	34.234	694	27.226	90.9	3.68	84.7	10.38	28.62		1476.
800	3.54	34.292	793	27.292	85.2	3.48	78.5	11.26	35.34		1477.
900	3.33	34.343	892	27.353	79.8	3.26	72.7	12.09	42.49		1478.
1000	3.14	34.388	991	27.407	75.0	3.07	67.5	12.86	49.98		1479.
1200	2.81	34.392	1188	27.439	72.3	2.73	64.4	14.31	66.31		1481.
1500	2.39	34.495	1484	27.557	61.6	2.29	53.1	16.35	94.26		1484.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0.00
2.00
4.00
6.00
8.00
10.00
SALINITY, 0/00
30.50
31.50
32.50
33.50
34.50
35.50
TEMPERATURE, C
1.00
4.00
7.00
10.00
13.00
16.00
DEPTH, METRES
X10
X100
X1000
* - 77 - 7 - 13

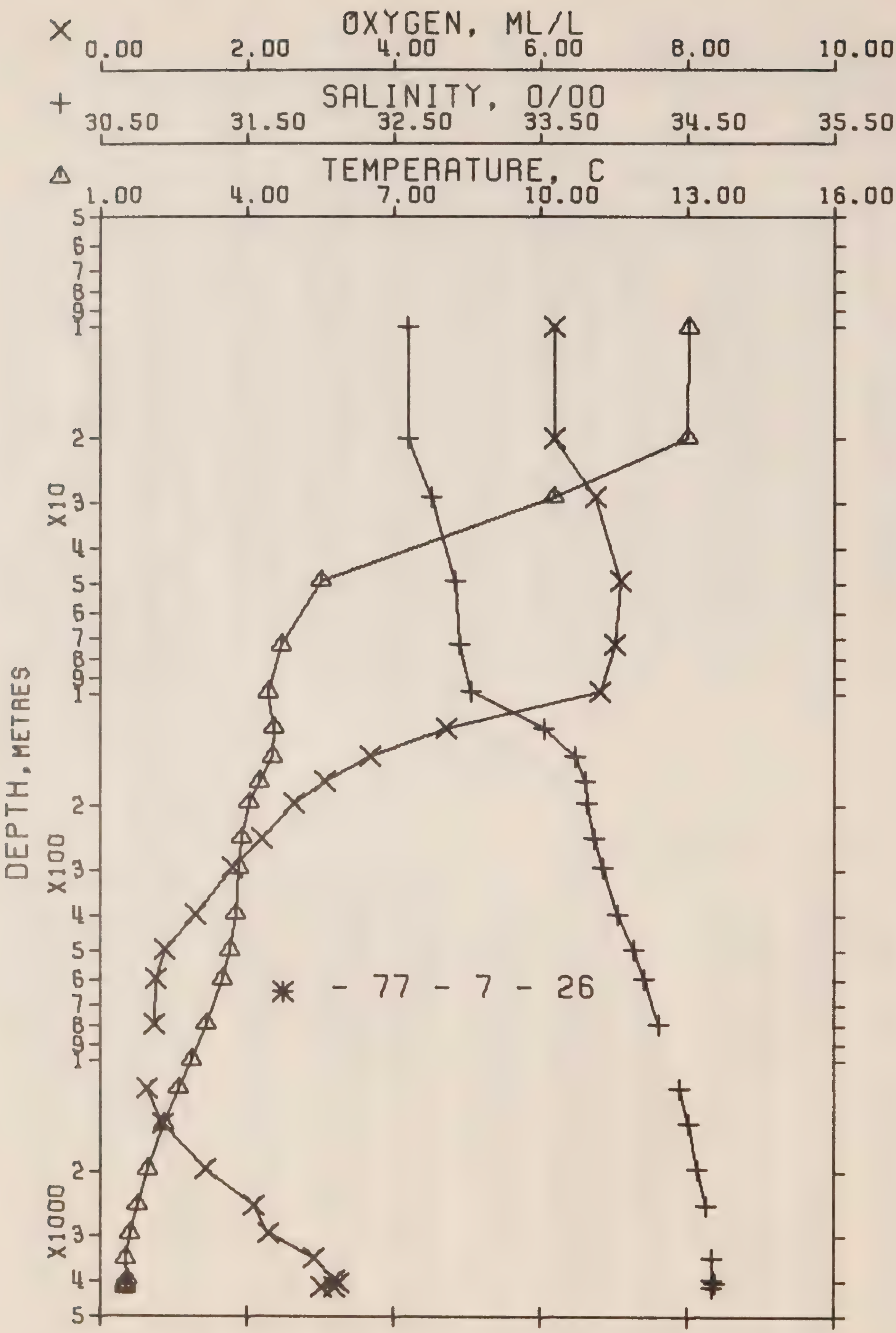
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 13 DATE 12/ 9/77 GMT 23.9
POSITION 50- .0 N, 145- .0 W STATION P
HYDROGRAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	13.90	32.568	0	24.353	358.3	13.90	358.3	.00	.00	6.35	1501.
10	13.70	32.564	10	24.391	354.9	13.70	354.6	.36	.02	6.39	1500.
20	12.80	32.616	20	24.610	334.3	12.80	333.8	.71	.07	6.49	1498.
30	10.61	32.710	30	25.085	289.2	10.61	288.5	1.02	.15	6.64	1490.
50	5.40	32.900	50	25.991	203.0	5.40	202.4	1.51	.35	7.13	1471.
75	4.89	32.940	75	26.080	194.7	4.88	193.9	2.01	.67	7.06	1469.
101	4.47	32.991	100	26.166	186.7	4.46	185.8	2.49	1.10	6.96	1468.
127	4.48	33.342	126	26.443	160.7	4.47	159.5	2.95	1.63	5.50	1469.
152	4.54	33.722	151	26.737	133.1	4.53	131.5	3.32	2.15	3.92	1470.
177	4.27	33.796	176	26.824	124.9	4.26	123.2	3.64	2.69	3.19	1469.
202	4.15	33.818	201	26.854	122.2	4.14	120.3	3.95	3.29	2.91	1469.
253	3.92	33.861	251	26.912	117.1	3.90	114.9	4.56	4.69	2.24	1469.
302	3.87	33.937	300	26.977	111.3	3.85	108.6	5.12	6.29	1.85	1470.
402	3.76	34.053	399	27.080	102.3	3.73	98.8	6.19	10.11	1.21	1471.
501	3.65	34.126	497	27.149	96.4	3.61	92.2	7.17	14.62	1.01	1472.
597	3.51	34.206	592	27.227	89.7	3.47	84.8	8.06	19.63	.76	1473.
818	3.16	34.329	810	27.358	78.4	3.10	72.3	9.91	32.89	.65	1476.
1017	2.82	34.405	1007	27.449	70.4	2.75	63.5	11.39	46.71	.56	1478.
1218	2.58	34.456	1205	27.511	65.1	2.50	57.6	12.74	62.12	.64	1480.
1520	2.28	34.521	1503	27.588	58.5	2.18	50.2	14.60	88.10	.89	1484.
2027	1.94	34.601	2002	27.679	50.8	1.80	41.3	17.38	138.13	1.45	1491.
2537	1.75*	34.634	2503	27.720	47.8	1.57	37.2	19.87	196.14	1.46	1499.
3048	1.59	34.663	3003	27.755	45.1	1.36	33.6	22.24	263.52	2.68	1507.
3557	1.51	34.674*	3501	27.770	44.6	1.23	31.9	24.51	340.15	2.78	1515.
4064	1.51	34.683*	3995	27.777	45.2	1.18	30.8	26.78	428.26	2.89	1524.
4164	1.51	34.685	4093	27.778	45.3	1.17	30.6	27.23	447.36	3.42	1526.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	13.90	32.568	0	24.353	358.3	13.90	358.3	.00	.00	6.35	1501.
10	13.70	32.564	10	24.391	354.9	13.70	354.6	.36	.02	6.39	1500.
20	12.80	32.616	20	24.610	334.3	12.80	333.8	.71	.07	6.49	1498.
30	10.61	32.710	30	25.085	289.2	10.61	288.5	1.02	.15	6.64	1490.
50	5.40	32.900	50	25.991	203.0	5.40	202.4	1.51	.35	7.13	1471.
75	4.89	32.940	75	26.080	194.7	4.88	193.9	2.01	.67	7.06	1469.
100	4.48	32.990	99	26.164	186.8	4.47	185.9	2.48	1.09	6.96	1468.
125	4.48	33.320	124	26.425	162.3	4.47	161.1	2.92	1.59	5.59	1469.
150	4.54	33.694	149	26.715	135.1	4.52	133.6	3.29	2.11	4.03	1470.
175	4.29	33.790	174	26.817	125.6	4.28	123.9	3.61	2.64	3.25	1469.
200	4.16	33.816	199	26.852	122.5	4.15	120.6	3.92	3.23	2.94	1469.
225	4.04	33.838	223	26.882	119.8	4.02	117.7	4.23	3.89	2.59	1469.
250	3.93	33.859	248	26.909	117.3	3.91	115.1	4.52	4.61	2.28	1469.
300	3.87	33.934	298	26.975	111.5	3.85	108.9	5.09	6.21	1.87	1470.
400	3.76	34.051	397	27.078	102.4	3.73	99.0	6.16	10.02	1.22	1471.
500	3.65	34.125	496	27.149	96.5	3.62	92.3	7.15	14.57	1.02	1472.
600	3.50	34.208	595	27.229	89.6	3.46	84.6	8.09	19.78	.76	1474.
700	3.33	34.268	694	27.293	84.0	3.28	78.5	8.95	25.52	.70	1474.
800	3.18	34.321	793	27.349	79.2	3.13	73.2	9.77	31.75	.65	1476.
900	3.01	34.362	892	27.398	74.9	2.95	68.4	10.54	38.42	.61	1477.
1000	2.85	34.399	990	27.442	71.0	2.78	64.2	11.27	45.48	.57	1478.
1200	2.60	34.452	1188	27.506	65.5	2.52	58.1	12.62	60.72	.63	1480.
1500	2.30	34.517	1484	27.583	58.9	2.20	50.6	14.49	86.32	.88	1484.
2000	1.96	34.597	1976	27.675	51.1	1.82	41.7	17.24	135.33	1.42	1491.
2500	1.76	34.632	2467	27.717	47.9	1.58	37.4	19.69	191.57	1.46	1498.
3000	1.60	34.661	2956	27.752	45.3	1.38	33.9	22.02	256.89	2.57	1506.
3500	1.52	34.673	3445	27.768	44.6	1.25	32.1	24.26	330.99	2.77	1514.
4000	1.51	34.682	3933	27.776	45.1	1.19	31.0	26.49	416.47	2.88	1523.
4100	1.51	34.684	4031	27.778	45.2	1.18	30.8	26.94	435.12	3.08	1524.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SALINITY, 0/00
30.50 31.50 32.50 33.50 34.50 35.50
TEMPERATURE, C
1.00 4.00 7.00 10.00 13.00 16.00
DEPTH, METRES
X10
X100
X1000
* - 77 - 7 - 26

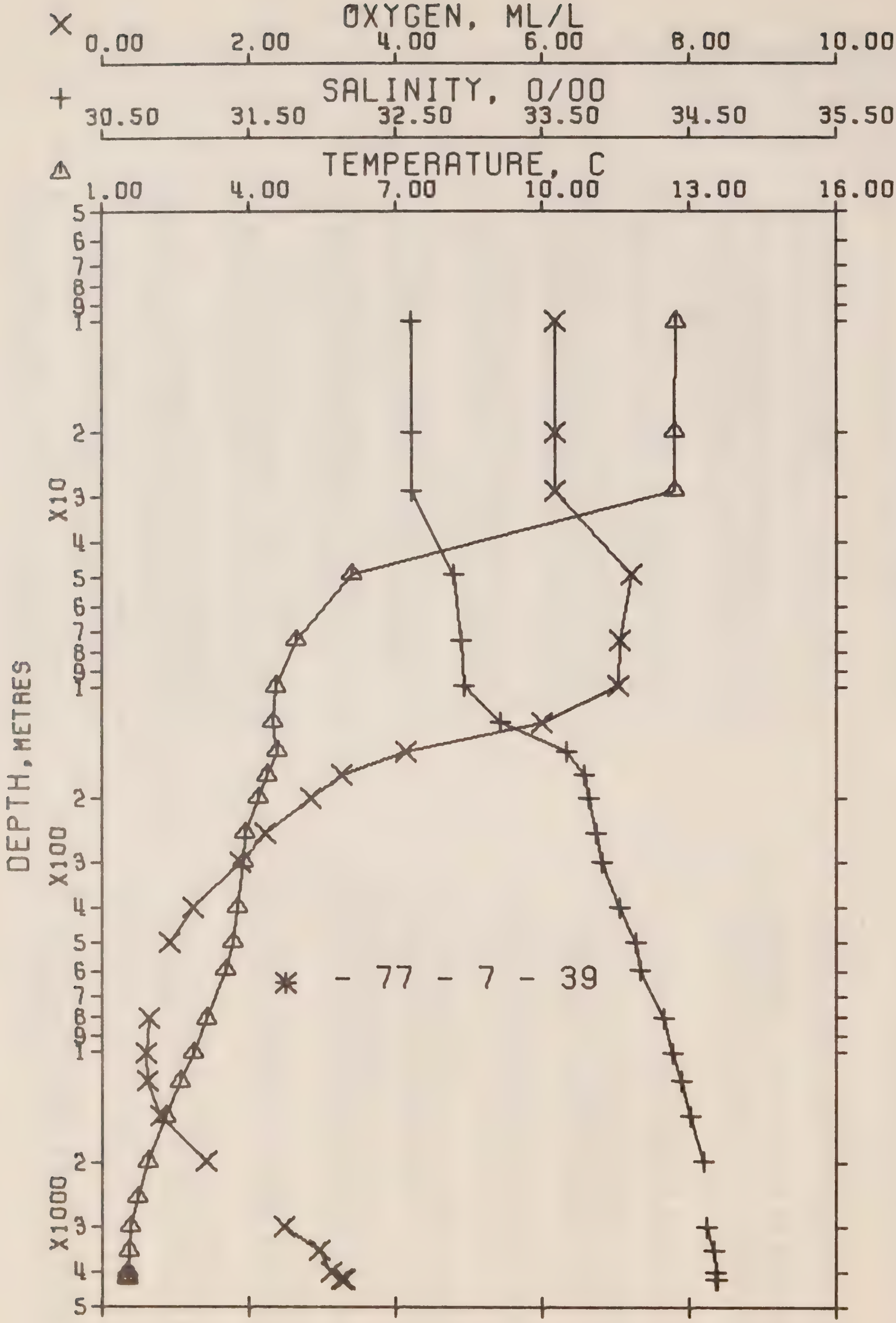
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 26 DATE 19/ 9/77 GMT 18.6
POSITION 50- .0 N, 145- .0 W STATION P
HYDROGRAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	13.02	32.599	0	24.554	339.2	13.02	339.1	.00	.00	6.20	1498.
10	13.02	32.598	10	24.553	339.5	13.02	339.2	.34	.02	6.21	1498.
20	13.01	32.601	20	24.557	339.3	13.01	338.8	.69	.07	6.21	1498.
29	10.27	32.763	29	25.185	279.7	10.27	279.0	.97	.14	6.76	1489.
49	5.50	32.924	49	25.998	202.3	5.50	201.7	1.45	.33	7.10	1471.
73	4.69	32.954	73	26.113	191.5	4.68	190.8	1.93	.63	7.03	1468.
99	4.41	33.032	98	26.204	183.0	4.40	182.1	2.40	1.04	6.81	1468.
124	4.54	33.526	123	26.582	147.5	4.53	146.3	2.81	1.51	4.72	1469.
148	4.50	33.744	147	26.759	130.9	4.49	129.4	3.15	1.97	3.69	1470.
173	4.25	33.807	172	26.835	123.8	4.24	122.2	3.47	2.50	3.07	1469.
198	4.04	33.825	197	26.871	120.6	4.03	118.8	3.78	3.08	2.65	1469.
248	3.87	33.867	246	26.922	116.1	3.85	113.9	4.36	4.41	2.19	1469.
298	3.83	33.931	296	26.977	111.3	3.81	108.7	4.93	6.00	1.80	1470.
399	3.76	34.033	396	27.065	103.7	3.73	100.3	6.02	9.86	1.30	1471.
501	3.65	34.138	497	27.159	95.5	3.61	91.3	7.03	14.51	.88	1472.
602	3.50	34.212	597	27.232	89.2	3.46	84.3	7.96	19.75	.77	1474.
799	3.16	34.308	792	27.341	79.8	3.11	73.9	9.63	31.60	.75*	1475.
1000	2.87	34.384*	990	27.428	72.3	2.80	65.5	11.15	45.53	.69*	1478.
1200	2.60	34.447	1188	27.502	65.9	2.52	58.5	12.53	61.03	.65	1480.
1502	2.30	34.515	1485	27.581	59.1	2.20	50.8	14.40	86.83	.86	1484.
2004	1.95	34.571	1980	27.654	53.0	1.81	43.7	17.23	137.18	1.44	1491.
2508	1.75	34.634	2474	27.720	47.7	1.57	37.2	19.76	195.35	2.09	1498.
3013	1.60	34.654*	2969	27.747	45.8	1.38	34.4	22.10	261.31	2.30	1506.
3521	1.52	34.671	3466	27.767	44.8	1.25	32.2	24.40	337.86	2.93	1515.
4032	1.53	34.673	3964	27.767	46.2	1.20	31.8	26.71	426.85	3.20	1523.
4133	1.52	34.689	4063	27.781	45.1	1.18	30.4	27.17	446.17	3.27	1525.
4226	1.52	34.673*	4153	27.768	46.5	1.17	31.6	27.60	464.17	3.01+	1527.
4236	1.52	34.671+	4163	27.767	46.6	1.17	31.7	27.64	466.23	3.21	1527.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	13.02	32.599	0	24.554	339.2	13.02	339.1	.00	.00	6.20	1498.
10	13.02	32.598	10	24.553	339.5	13.02	339.2	.34	.02	6.21	1498.
20	13.01	32.601	20	24.557	339.3	13.01	338.8	.69	.07	6.21	1498.
30	10.01	32.772	30	25.235	274.9	10.01	274.3	.99	.15	6.78	1488.
50	5.47	32.925	50	26.002	201.9	5.47	201.3	1.47	.34	7.10	1471.
75	4.67	32.960	75	26.120	190.9	4.66	190.2	1.96	.65	7.01	1468.
100	4.42	33.062	99	26.227	180.8	4.41	179.9	2.42	1.07	6.68	1468.
125	4.54	33.538	124	26.591	146.6	4.53	145.4	2.83	1.53	4.67	1469.
150	4.48	33.749	149	26.765	130.3	4.47	128.8	3.17	2.01	3.64	1470.
175	4.23	33.808	174	26.838	123.6	4.22	121.9	3.49	2.54	3.04	1469.
200	4.03	33.827	199	26.873	120.4	4.02	118.6	3.79	3.12	2.63	1469.
225	3.94	33.849	223	26.900	118.0	3.93	116.0	4.09	3.76	2.39	1469.
250	3.87	33.870	248	26.924	115.9	3.85	113.7	4.38	4.47	2.17	1469.
300	3.83	33.933	298	26.978	111.1	3.81	108.5	4.95	6.06	1.79	1470.
400	3.76	34.034	397	27.065	103.7	3.73	100.2	6.03	9.89	1.30	1471.
500	3.65	34.137	496	27.158	95.6	3.62	91.4	7.02	14.45	.88	1472.
600	3.50	34.211	595	27.231	89.3	3.46	84.4	7.95	19.63	.77	1473.
700	3.32	34.263	694	27.290	84.2	3.27	78.7	8.81	25.37	.76	1474.
800	3.16	34.308	793	27.341	79.8	3.10	73.9	9.63	31.64	.75	1475.
900	3.01	34.349	892	27.387	75.8	2.94	69.4	10.41	38.38	.72	1476.
1000	2.87	34.384	990	27.428	72.3	2.80	65.5	11.15	45.53	.69	1478.
1200	2.60	34.447	1188	27.502	65.9	2.52	58.5	12.53	61.03	.65	1480.
1500	2.30	34.515	1484	27.581	59.1	2.20	50.8	14.39	86.69	.86	1484.
2000	1.95	34.571	1976	27.654	53.0	1.82	43.7	17.20	136.69	1.43	1491.
2500	1.75	34.633	2467	27.719	47.8	1.57	37.3	19.72	194.42	2.08	1498.
3000	1.60	34.654	2956	27.746	45.8	1.38	34.4	22.04	259.51	2.30	1506.
3500	1.52	34.670	3445	27.766	44.9	1.25	32.3	24.30	334.46	2.90	1514.
4000	1.53	34.673	3933	27.767	46.1	1.21	31.8	26.56	420.86	3.19	1523.
4100	1.52	34.684	4031	27.777	45.5	1.19	30.9	27.02	439.84	3.25	1524.
4200	1.52	34.677	4128	27.772	46.1	1.17	31.7	[illegible]	[illegible]	[illegible]	[illegible]



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SALINITY, 0/00
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TEMPERATURE, C
1.00 4.00 7.00 10.00 13.00 16.00
DEPTH, METRES
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X100
X1000
✱ - 77 - 7 - 39

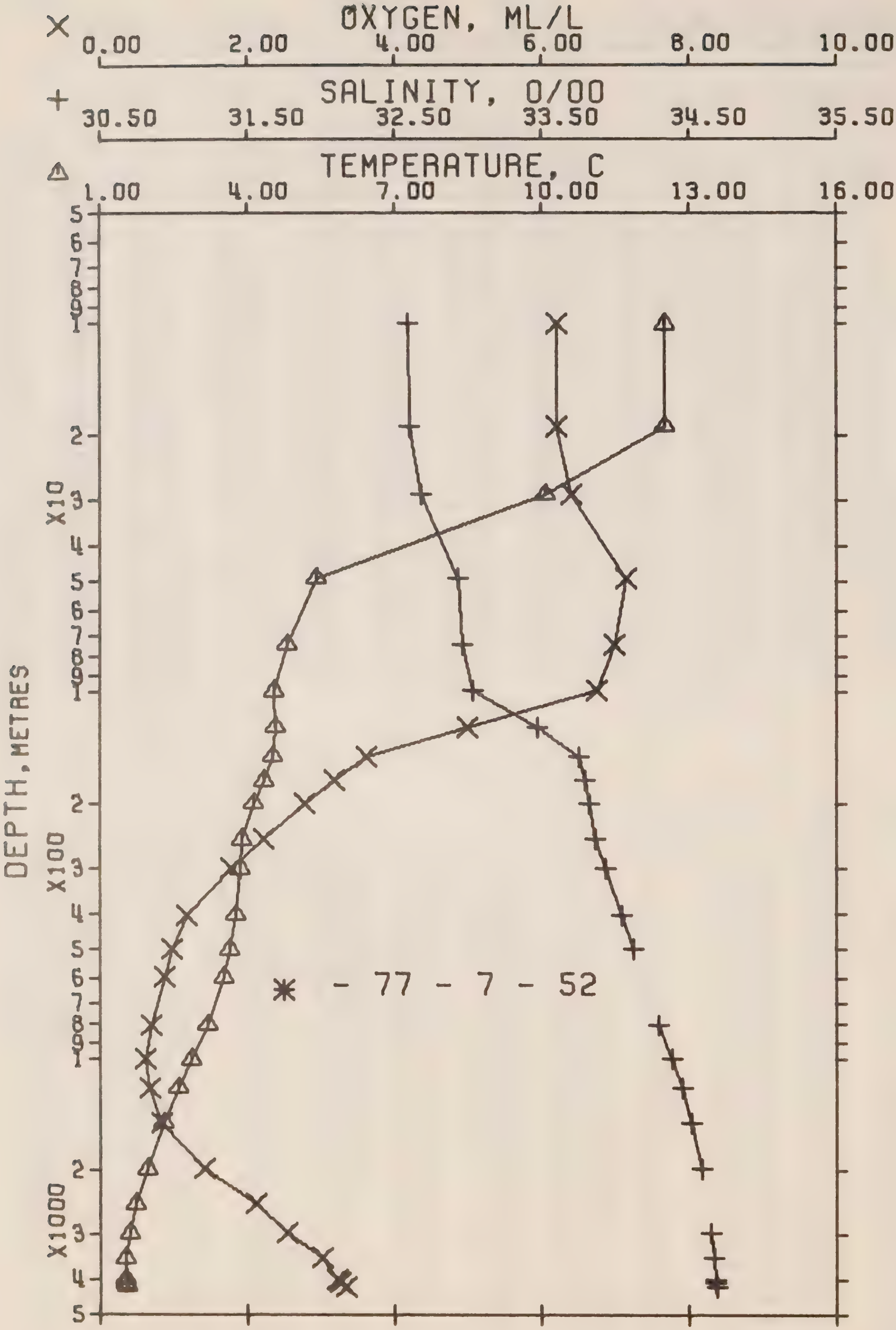
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 39 DATE 26/ 9/77 GMT 19.0
POSITION 50- .0 N. 145- .0 W STATION P
HYDROGRAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.69	32.609	0	24.626	332.3	12.69	332.3	.00	.00	6.16	1497.
10	12.73	32.607	10	24.617	333.4	12.73	333.1	.33	.02	6.19	1497.
20	12.71	32.609	20	24.622	333.1	12.71	332.6	.67	.07	6.19	1497.
29	12.71	32.607	29	24.621	333.5	12.71	332.7	.98	.15	6.19	1497.
49	6.10	32.898	49	25.905	211.2	6.10	210.6	1.52	.36	7.21	1474.
74	4.96	32.948	74	26.079	194.8	4.95	194.0	2.03	.68	7.06	1469.
100	4.55	32.973	99	26.143	188.8	4.54	187.9	2.52	1.11	7.04	1468.
125	4.47	33.221	124	26.348	169.6	4.46	168.5	2.97	1.63	6.00	1468.
150	4.56	33.666	149	26.690	137.4	4.55	135.9	3.36	2.17	4.13	1470.
175	4.36	33.787	174	26.808	126.5	4.35	124.8	3.69	2.72	3.26	1470.
201	4.18	33.817	200	26.850	122.6	4.17	120.7	4.01	3.34	2.85	1469.
252	3.90	33.870	250	26.921	116.2	3.88	114.0	4.61	4.73	2.22	1469.
302	3.87	33.914	300	26.959	113.0	3.85	110.4	5.19	6.35	1.89	1470.
403	3.75	34.035	400	27.067	103.5	3.72	100.0	6.28	10.28	1.23	1471.
502	3.66	34.139	498	27.159	95.6	3.62	91.3	7.27	14.81	.93	1472.
598	3.51	34.173	593	27.200	92.2	3.47	87.3	8.16	19.85	.83*	1473.
816	3.14	34.327	809	27.358	78.3	3.08	72.3	10.02	33.16	.65	1476.
1016	2.85	34.369	1006	27.434	71.9	2.78	65.0	11.51	47.09	.59	1478.
1216	2.59	34.454	1204	27.508	65.4	2.51	57.9	12.89	62.74	.62	1480.
1518	2.30	34.515	1501	27.581	59.1	2.20	50.8	14.75	88.72	.80	1484.
2024	1.94	34.600	1999	27.678	50.8	1.80	41.4	17.54	138.90	1.43	1491.
2533	1.72	34.613*	2499	27.705	48.9	1.54	38.6	20.05	197.26	2.01*	1499.
3043	1.56	34.623	2999	27.724	47.8	1.35	36.6	22.51	267.30	2.48	1507.
3554	1.54	34.672	3498	27.766	45.1	1.26	32.3	24.89	347.23	2.96	1515.
4066	1.51	34.676	3997	27.771	45.7	1.18	31.4	27.20	437.02	3.11	1524.
4167	1.51	34.680*	4096	27.775	45.7	1.17	31.0	27.67	456.50	3.20*	1526.
4260	1.52	34.684	4186	27.777	45.8	1.17	30.7	28.09	474.71	3.27	1527.
4270	1.52	34.689	4196	27.781	45.5	1.17	30.3	28.14	476.75	3.30	1527.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.69	32.609	0	24.626	332.3	12.69	332.3	.00	.00	6.16	1497.
10	12.73	32.607	10	24.617	333.4	12.73	333.1	.33	.02	6.19	1497.
20	12.71	32.609	20	24.622	333.1	12.71	332.6	.67	.07	6.19	1497.
30	12.35	32.623	30	24.701	325.8	12.35	325.0	1.01	.16	6.24	1496.
50	6.06	32.900	50	25.911	210.6	6.06	210.0	1.54	.37	7.21	1473.
75	4.95	32.949	75	26.080	194.6	4.94	193.9	2.05	.69	7.06	1469.
100	4.55	32.973	99	26.143	188.8	4.54	187.9	2.52	1.11	7.04	1468.
125	4.47	33.221	124	26.348	169.6	4.46	168.5	2.97	1.63	6.00	1468.
150	4.56	33.666	149	26.690	137.4	4.55	135.9	3.36	2.17	4.13	1470.
175	4.36	33.787	174	26.808	126.5	4.35	124.8	3.69	2.72	3.26	1470.
200	4.19	33.815	199	26.848	122.8	4.17	120.9	4.00	3.30	2.87	1469.
225	4.04	33.843	223	26.886	119.4	4.03	117.4	4.30	3.96	2.53	1469.
250	3.91	33.868	248	26.919	116.4	3.89	114.2	4.59	4.67	2.24	1469.
300	3.87	33.912	298	26.958	113.1	3.85	110.5	5.16	6.28	1.90	1470.
400	3.75	34.032	397	27.064	103.8	3.73	100.3	6.25	10.14	1.25	1471.
500	3.66	34.137	496	27.157	95.7	3.63	91.5	7.25	14.71	.93	1472.
600	3.51	34.175	595	27.202	92.1	3.46	87.2	8.18	19.95	.83	1473.
700	3.32	34.251	694	27.280	85.2	3.27	79.7	9.07	25.82	.74	1474.
800	3.16	34.317	793	27.348	79.2	3.11	73.3	9.89	32.09	.66	1475.
900	3.01	34.355	892	27.392	75.4	2.95	69.0	10.66	38.76	.62	1477.
1000	2.87	34.385	990	27.428	72.3	2.80	65.5	11.40	45.92	.60	1478.
1200	2.61	34.449	1188	27.503	65.9	2.53	58.4	12.78	61.41	.62	1480.
1500	2.32	34.512	1484	27.577	59.5	2.21	51.2	14.65	87.10	.79	1484.
2000	1.95	34.597	1976	27.674	51.2	1.82	41.8	17.42	136.41	1.40	1491.
2500	1.73	34.612	2467	27.703	49.0	1.56	38.8	19.89	193.11	1.97	1498.
3000	1.59	34.622	2956	27.722	47.9	1.37	36.7	22.30	260.90	2.44	1506.
3500	1.54	34.667	3445	27.762	45.4	1.27	32.7	24.65	338.45	2.91	1514.
4000	1.51	34.676	3933	27.771	45.6	1.19	31.5	26.90	424.72	3.09	1523.
4100	1.51	34.677	4031	27.772	45.7	1.18	31.3	27.36	443.58	3.14	1524.
4200	1.51	34.682	4128	27.775	45.7	1.17	30.9	27.82	462.90	3.22	1526.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SALINITY, 0/00
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TEMPERATURE, C
1.00 4.00 7.00 10.00 13.00 16.00
DEPTH, METRES
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X100
X1000
* - 77 - 7 - 52

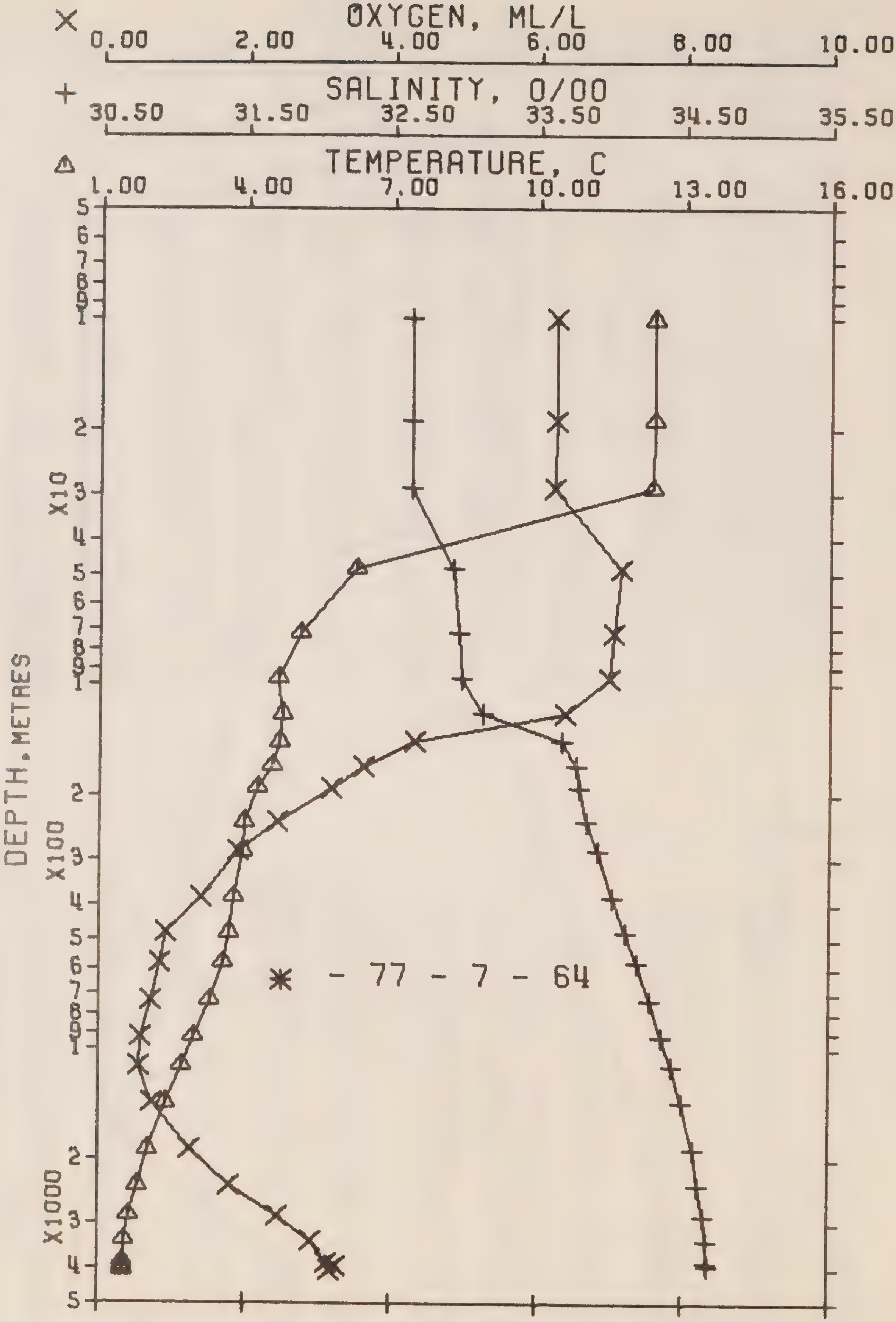
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 52 DATE 3/10/77 GMT 19.2
POSITION 50- .0 N, 145- .0 W STATION P
HYDROGRAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.52	32.602	0	24.653	329.7	12.52	329.7	.00	.00	6.21	1496.
10	12.53	32.605	10	24.654	329.9	12.53	329.6	.33	.02	6.21	1496.
19	12.52	32.608	19	24.658	329.7	12.52	329.2	.64	.06	6.21	1497.
29	10.10	32.692	29	25.158	282.2	10.10	281.6	.94	.14	6.42	1488.
49	5.41	32.937	49	26.019	200.3	5.41	199.8	1.43	.33	7.16	1471.
74	4.82	32.966	74	26.108	192.0	4.81	191.2	1.92	.64	7.01	1469.
100	4.54	33.041	99	26.198	183.6	4.53	182.7	2.40	1.07	6.75	1468.
125	4.57	33.482	124	26.544	151.1	4.56	149.9	2.82	1.55	5.00	1469.
150	4.50	33.765	149	26.775	129.4	4.49	127.9	3.17	2.04	3.61	1470.
175	4.32	33.802	174	26.824	125.0	4.31	123.3	3.49	2.57	3.18	1469.
201	4.13	33.831	200	26.867	121.0	4.12	119.2	3.81	3.19	2.78	1469.
253	3.88	33.869	251	26.922	116.1	3.86	113.9	4.42	4.60	2.21	1469.
304	3.85	33.937	302	26.979	111.1	3.83	108.4	5.01	6.25	1.78	1470.
406	3.77	34.049	403	27.076	102.7	3.74	99.2	6.10	10.19	1.18	1471.
506	3.65	34.127	502	27.150	96.4	3.61	92.1	7.09	14.81	.98	1472.
602	3.52	34.190*	597	27.212	91.1	3.48	86.1	7.99	19.89	.88	1474.
811	3.20	34.297	804	27.328	81.2	3.14	75.1	9.79	32.81	.70	1476.
1010	2.87	34.387	1000	27.430	72.2	2.80	65.3	11.30	46.88	.61	1478.
1208	2.59	34.457	1196	27.511	65.1	2.51	57.6	12.66	62.25	.68	1480.
1510	2.29	34.525	1493	27.590	58.2	2.19	50.0	14.51	87.81	.85	1484.
2016	1.95	34.591	1991	27.670	51.6	1.81	42.2	17.29	137.75	1.41	1491.
2526	1.73	34.621*	2492	27.711	48.4	1.55	38.0	19.83	196.41	2.12	1498.
3037	1.61	34.646	2993	27.740	46.6	1.38	35.0	22.25	265.08	2.54	1507.
3550	1.52	34.673	3494	27.768	44.8	1.24	32.1	24.59	343.64	3.02	1515.
4059	1.52	34.678	3991	27.772	45.7	1.19	31.3	26.88	432.62	3.22	1524.
4161	1.52	34.679	4090	27.773	45.9	1.18	31.2	27.35	452.13	3.26	1526.
4252	1.53	34.688	4179	27.779	45.7	1.18	30.5	27.77	470.07	3.34	1527.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.52	32.602	0	24.653	329.7	12.52	329.7	.00	.00	6.21	1496.
10	12.53	32.605	10	24.654	329.9	12.53	329.6	.33	.02	6.21	1496.
20	12.26	32.617	20	24.715	324.3	12.26	323.8	.66	.07	6.23	1496.
30	9.85	32.705	30	25.210	277.2	9.84	276.6	.97	.14	6.46	1487.
50	5.39	32.938	50	26.022	200.0	5.39	199.5	1.44	.34	7.15	1471.
75	4.81	32.968	75	26.111	191.7	4.81	191.0	1.93	.65	7.00	1469.
100	4.54	33.041	99	26.198	183.6	4.53	182.7	2.40	1.07	6.75	1468.
125	4.57	33.482	124	26.544	151.1	4.56	149.9	2.82	1.55	5.00	1469.
150	4.50	33.765	149	26.775	129.4	4.49	127.9	3.17	2.04	3.61	1470.
175	4.32	33.802	174	26.824	125.0	4.31	123.3	3.49	2.57	3.18	1469.
200	4.14	33.830	199	26.865	121.2	4.13	119.4	3.80	3.15	2.80	1469.
225	4.01	33.849	223	26.894	118.6	3.99	116.6	4.10	3.80	2.50	1469.
250	3.89	33.867	248	26.920	116.3	3.88	114.1	4.39	4.51	2.24	1469.
300	3.85	33.932	298	26.975	111.5	3.83	108.8	4.96	6.11	1.81	1470.
400	3.77	34.043	397	27.071	103.1	3.75	99.7	6.03	9.93	1.21	1471.
500	3.66	34.123	496	27.146	96.8	3.62	92.5	7.03	14.50	.99	1472.
600	3.52	34.188	595	27.211	91.2	3.48	86.3	7.97	19.77	.88	1474.
700	3.36	34.244	694	27.271	86.1	3.31	80.5	8.86	25.64	.79	1475.
800	3.22	34.292	793	27.323	81.6	3.16	75.6	9.69	32.04	.71	1476.
900	3.04	34.340	892	27.377	76.9	2.98	70.4	10.49	38.92	.66	1477.
1000	2.88	34.383	990	27.426	72.6	2.82	65.8	11.23	46.15	.62	1478.
1200	2.60	34.454	1188	27.507	65.4	2.52	57.9	12.61	61.58	.67	1480.
1500	2.30	34.523	1484	27.588	58.4	2.20	50.2	14.45	86.95	.84	1484.
2000	1.96	34.589	1976	27.668	51.7	1.82	42.4	17.21	136.09	1.40	1491.
2500	1.74	34.620	2467	27.709	48.6	1.56	38.2	19.70	193.19	2.09	1498.
3000	1.62	34.644	2956	27.738	46.7	1.40	35.2	22.07	259.72	2.51	1506.
3500	1.53	34.671	3445	27.766	44.9	1.26	32.3	24.36	335.61	2.98	1514.
4000	1.52	34.677	3933	27.772	45.6	1.20	31.4	26.61	421.47	3.20	1523.
4100	1.52	34.678	4031	27.772	45.8	1.19	31.3	27.07	440.34	3.23	1524.
4200	1.52	34.683	4128	27.776	45.8	1.18	30.9	27.53	459.74	3.29	1526.



OXYGEN, ML/L
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10.00
SALINITY, 0/00
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31.50
32.50
33.50
34.50
35.50
TEMPERATURE, C
1.00
4.00
7.00
10.00
13.00
16.00
DEPTH, METRES
X10
X100
X1000
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6
7
8
9
1
2
3
4
5
* - 77 - 7 - 64

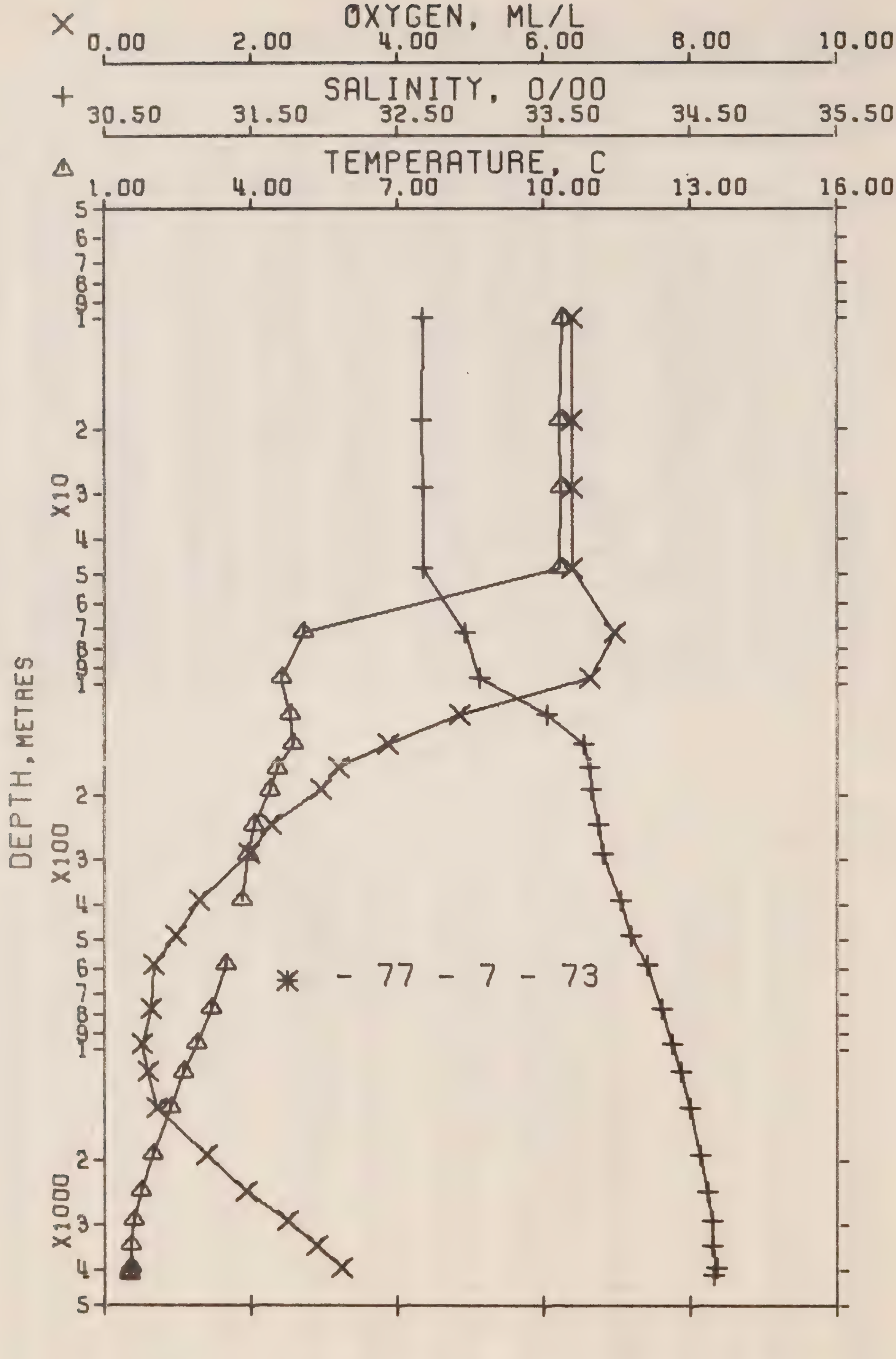
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 64 DATE 9/10/77 GMT 19.6
POSITION 50- .0 N, 145- .0 W STATION P
HYDROGRAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.36	32.628	0	24.704	324.9	12.36	324.9	.00	.00	6.23	1496.
10	12.37	32.629	10	24.703	325.2	12.37	324.9	.33	.02	6.23	1496.
19	12.37	32.627	19	24.701	325.6	12.37	325.1	.62	.06	6.24	1496.
29	12.34	32.633	29	24.712	324.8	12.34	324.1	.96	.14	6.22	1496.
48	6.26	32.920	48	25.902	211.5	6.26	210.8	1.47	.34	7.13	1474.
72	5.10	32.961	72	26.073	195.3	5.09	194.6	1.96	.64	7.05	1470.
97	4.67	32.983	96	26.138	189.3	4.66	188.4	2.42	1.04	6.99	1469.
121	4.76	33.134	120	26.248	179.1	4.75	178.0	2.87	1.54	6.38	1469.
144	4.69	33.666	143	26.676	139.8	4.68	137.3	3.24	2.03	4.32	1470.
168	4.54	33.773	167	26.777	129.4	4.53	127.7	3.56	2.55	3.62	1470.
192	4.25	33.794	191	26.825	125.0	4.24	123.1	3.87	3.11	3.17	1469.
240	3.97	33.843	238	26.893	118.8	3.95	116.7	4.44	4.38	2.44	1469.
288	3.94	33.917	286	26.954	113.4	3.92	110.8	5.01	5.89	1.91	1470.
385	3.77	34.022	382	27.055	104.6	3.74	101.2	6.06	9.50	1.40	1471.
483	3.68	34.111	479	27.134	97.7	3.65	93.6	7.05	13.88	.92	1472.
584	3.54	34.186	579	27.208	91.4	3.50	86.6	8.00	19.07	.83	1473.
741	3.27	34.285	734	27.312	82.3	3.22	76.6	9.36	28.22	.71	1475.
933	2.96	34.362	924	27.402	74.6	2.90	68.0	10.87	41.03	.59	1477.
1125	2.71	34.426	1114	27.475	68.2	2.63	61.0	12.24	55.40	.55	1479.
1418	2.39	34.500	1403	27.562	60.8	2.29	52.7	14.12	79.78	.73	1483.
1911	2.01	34.577	1888	27.654	52.9	1.88	43.7	16.92	127.05	1.26	1489.
2410	1.80	34.615	2378	27.701	49.4	1.63	39.1	19.47	183.17	1.80	1497.
2911	1.62	34.655	2869	27.746	45.7	1.41	34.5	21.84	247.39	2.46	1505.
3415	1.53	34.673	3362	27.767	44.6	1.27	32.2	24.10	320.38	2.93	1513.
3917	1.51	34.669	3852	27.766	45.8	1.20	32.0	26.39	405.83	3.13	1521.
4017	1.52	34.684	3950	27.777	45.2	1.19	30.9	26.84	424.34	3.25	1523.
4107	1.51	34.684*	4037	27.778	45.3	1.17	30.8	27.25	441.04	3.22*	1525.
4117	1.51	34.684*	4047	27.778	45.3	1.17	30.8	27.29	442.98	3.18+	1525.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	12.36	32.628	0	24.704	324.9	12.36	324.9	.00	.00	6.23	1496.
10	12.37	32.629	10	24.703	325.2	12.37	324.9	.33	.02	6.23	1496.
20	12.37	32.628	20	24.702	325.5	12.36	325.0	.65	.07	6.24	1496.
30	12.00	32.649	30	24.789	317.5	11.99	316.7	.98	.15	6.27	1495.
50	6.16	32.924	50	25.918	210.0	6.16	209.4	1.50	.36	7.12	1474.
75	5.05	32.964	75	26.081	194.6	5.04	193.8	2.01	.68	7.04	1470.
100	4.68	33.006	99	26.155	187.7	4.68	186.8	2.49	1.11	6.89	1469.
125	4.75	33.238	124	26.332	171.2	4.74	170.0	2.94	1.63	5.98	1470.
150	4.65	33.694	149	26.703	136.3	4.64	134.7	3.32	2.16	4.14	1470.
175	4.45	33.779	174	26.792	128.1	4.44	126.3	3.65	2.70	3.49	1470.
200	4.20	33.803	199	26.837	123.9	4.19	122.0	3.96	3.30	3.04	1469.
225	4.05	33.829	223	26.873	120.6	4.03	118.5	4.27	3.96	2.65	1469.
250	3.96	33.860	248	26.907	117.6	3.95	115.4	4.57	4.68	2.32	1469.
300	3.92	33.932	298	26.968	112.1	3.90	109.5	5.14	6.29	1.84	1470.
400	3.75	34.037	397	27.068	103.4	3.73	99.9	6.22	10.13	1.32	1471.
500	3.65	34.125	496	27.148	96.6	3.62	92.3	7.22	14.71	.90	1472.
600	3.51	34.197	595	27.220	90.4	3.47	85.5	8.15	19.95	.82	1474.
700	3.33	34.261	694	27.288	84.5	3.29	79.0	9.02	25.73	.74	1474.
800	3.17	34.311	793	27.342	79.7	3.11	73.7	9.84	31.99	.67	1475.
900	3.01	34.350	892	27.388	75.8	2.95	69.3	10.62	38.72	.61	1477.
1000	2.87	34.386	990	27.429	72.2	2.80	65.4	11.36	45.88	.58	1478.
1200	2.62	34.447	1188	27.500	66.2	2.54	58.7	12.74	61.35	.60	1480.
1500	2.32	34.514	1484	27.579	59.3	2.22	51.0	14.61	87.07	.83	1484.
2000	1.97	34.584	1976	27.663	52.2	1.83	42.8	17.38	136.38	1.36	1491.
2500	1.76	34.623	2467	27.710	48.7	1.59	38.2	19.91	194.24	1.92	1498.
3000	1.60	34.658	2956	27.750	45.5	1.38	34.1	22.24	259.66	2.55	1506.
3500	1.53	34.672	3445	27.767	44.8	1.26	32.2	24.48	333.80	2.97	1514.
4000	1.52	34.681	3933	27.775	45.3	1.19	31.1	26.77	421.13	3.23	1523.
4100	1.51	34.684	4031	27.778	45.2	1.18	30.8	27.22	439.78	3.22	1524.


OXYGEN, ML/L
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SALINITY, 0/00
30.50 31.50 32.50 33.50 34.50 35.50
TEMPERATURE, C
1.00 4.00 7.00 10.00 13.00 16.00
DEPTH, METRES
X10
X100
X1000
* - 77 - 7 - 73

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 73 DATE 18/10/77 GMT 18.8
POSITION 50- .0 N, 145- .0 W STATION P
HYDROGRAPHIC CAST DATA

OBSERVED DATA

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	10.39	32.676	0	25.097	287.5	10.39	287.5	.00	.00	6.43	1489.
10	10.39	32.676	10	25.097	287.7	10.39	287.5	.29	.01	6.39	1489.
19	10.34	32.675	19	25.104	287.1	10.34	286.7	.55	.05	6.40	1489.
29	10.35	32.679	29	25.106	287.2	10.35	286.5	.84	.12	6.41	1489.
48	10.34	32.681	48	25.109	287.2	10.33	286.2	1.41	.35	6.40	1489.
72	5.08	32.975	72	26.087	194.1	5.07	193.3	1.99	.70	6.98	1470.
97	4.62	33.071	96	26.213	182.2	4.61	181.3	2.44	1.09	6.63	1468.
122	4.81	33.529	121	26.555	150.1	4.80	148.8	2.86	1.56	4.86	1470.
146	4.86	33.785	145	26.752	131.7	4.85	130.1	3.20	2.02	3.88	1471.
170	4.55	33.821	169	26.814	125.9	4.54	124.2	3.51	2.52	3.20	1470.
195	4.38	33.832	194	26.841	123.5	4.37	121.6	3.82	3.11	2.96	1470.
244	4.06	33.879	242	26.912	117.1	4.04	114.8	4.40	4.41	2.28	1470.
293	3.93	33.915	291	26.954	113.5	3.91	110.9	4.97	5.97	1.97	1470.
392	3.81	34.030	389	27.057	104.4	3.78	101.0	6.05	9.72	1.29	1471.
491	3.63*	34.102	487	27.132	98.0	3.60	93.9	7.05	14.24	.98	1472.
589	3.49	34.206	584	27.228	89.5	3.45	84.6	7.97	19.28	.67	1473.
775	3.18	34.310	768	27.341	79.8	3.13	73.9	9.54	30.16	.64	1475.
967	2.89	34.382	958	27.424	72.5	2.82	65.9	11.00	43.12	.53	1477.
1162	2.63	34.442	1150	27.495	66.4	2.55	59.1	12.35	57.72	.59	1479.
1457	2.35	34.498	1441	27.564	60.7	2.25	52.5	14.22	82.66	.73	1483.
1956	1.99	34.569	1932	27.649	53.4	1.86	44.2	17.06	132.06	1.41	1490.
2462	1.76	34.625	2429	27.712	48.3	1.59	38.0	19.62	189.59	1.94	1498.
2970	1.60	34.651	2927	27.745	45.9	1.38	34.6	22.00	255.35	2.50	1505.
3480	1.53	34.650	3426	27.749	46.3	1.26	33.9	24.36	333.07	2.90	1514.
3987	1.53	34.685	3920	27.777	45.2	1.21	30.9	26.63	419.15	3.23	1523.
4087	1.51	34.662*	4018	27.760	46.7	1.18	32.4	27.09	438.21	3.24*	1524.
4178	1.51	34.659+	4107	27.758	47.2	1.17	32.6	27.52	456.26	3.24*	1526.
4188	1.52	34.660*	4116	27.758	47.3	1.18	32.6	27.56	458.12	3.25*	1526.

INTERPOLATED TO STANDARD PRESSURE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	THETA	SVA (THETA)	DELTA D	POT. EN	OXY	SOUND
0	10.39	32.676	0	25.097	287.5	10.39	287.5	.00	.00	6.43	1489.
10	10.39	32.676	10	25.097	287.7	10.39	287.5	.29	.01	6.39	1489.
20	10.34	32.675	20	25.104	287.1	10.34	286.7	.57	.06	6.40	1489.
30	10.35	32.679	30	25.106	287.2	10.35	286.5	.86	.13	6.41	1489.
50	9.89	32.706	50	25.205	278.1	9.88	277.1	1.46	.38	6.45	1488.
75	5.02	32.987	75	26.102	192.6	5.02	191.8	2.03	.74	6.93	1470.
100	4.65	33.139	99	26.264	177.4	4.64	176.4	2.50	1.15	6.37	1469.
125	4.82	33.566	124	26.583	147.5	4.81	146.1	2.90	1.62	4.72	1470.
150	4.81	33.791	149	26.763	130.7	4.79	129.1	3.25	2.10	3.76	1471.
175	4.52	33.823	174	26.820	125.4	4.50	123.6	3.57	2.63	3.15	1470.
200	4.35	33.837	199	26.849	122.8	4.33	120.9	3.88	3.22	2.89	1470.
225	4.18	33.862	223	26.886	119.4	4.16	117.3	4.18	3.88	2.53	1470.
250	4.04	33.884	248	26.918	116.6	4.02	114.3	4.48	4.59	2.24	1470.
300	3.92	33.924	298	26.962	112.7	3.90	110.1	5.05	6.20	1.92	1470.
400	3.79	34.036	397	27.064	103.8	3.77	100.4	6.13	10.05	1.26	1471.
500	3.62	34.112	496	27.141	97.1	3.58	92.9	7.14	14.68	.95	1472.
600	3.47	34.213	595	27.236	88.8	3.43	83.9	8.07	19.87	.67	1473.
700	3.30	34.271	694	27.299	83.3	3.25	77.9	8.93	25.57	.65	1474.
800	3.14	34.320	793	27.353	78.7	3.08	72.8	9.74	31.75	.62	1475.
900	2.98	34.359	892	27.397	74.9	2.92	68.5	10.50	38.40	.57	1476.
1000	2.84	34.393	990	27.437	71.4	2.77	64.7	11.23	45.48	.54	1478.
1200	2.59	34.450	1188	27.505	65.6	2.51	58.2	12.60	60.75	.61	1480.
1500	2.31	34.505	1484	27.572	59.9	2.21	51.7	14.48	86.58	.80	1484.
2000	1.97	34.574	1976	27.655	52.9	1.83	43.6	17.30	136.81	1.46	1491.
2500	1.75	34.627	2467	27.715	48.1	1.57	37.7	19.81	194.26	1.99	1498.
3000	1.60	34.651	2956	27.745	45.9	1.37	34.6	22.14	259.56	2.53	1506.
3500	1.53	34.651	3445	27.750	46.3	1.26	33.8	24.45	336.33	2.91	1514.
4000	1.53	34.682	3933	27.775	45.4	1.20	31.1	26.69	421.63	3.23	1523.
4100	1.51	34.662	4031	27.760	46.8	1.18	32.5	27.15	440.72	3.24	1524.

Results of STP Observations

(P-77-7)

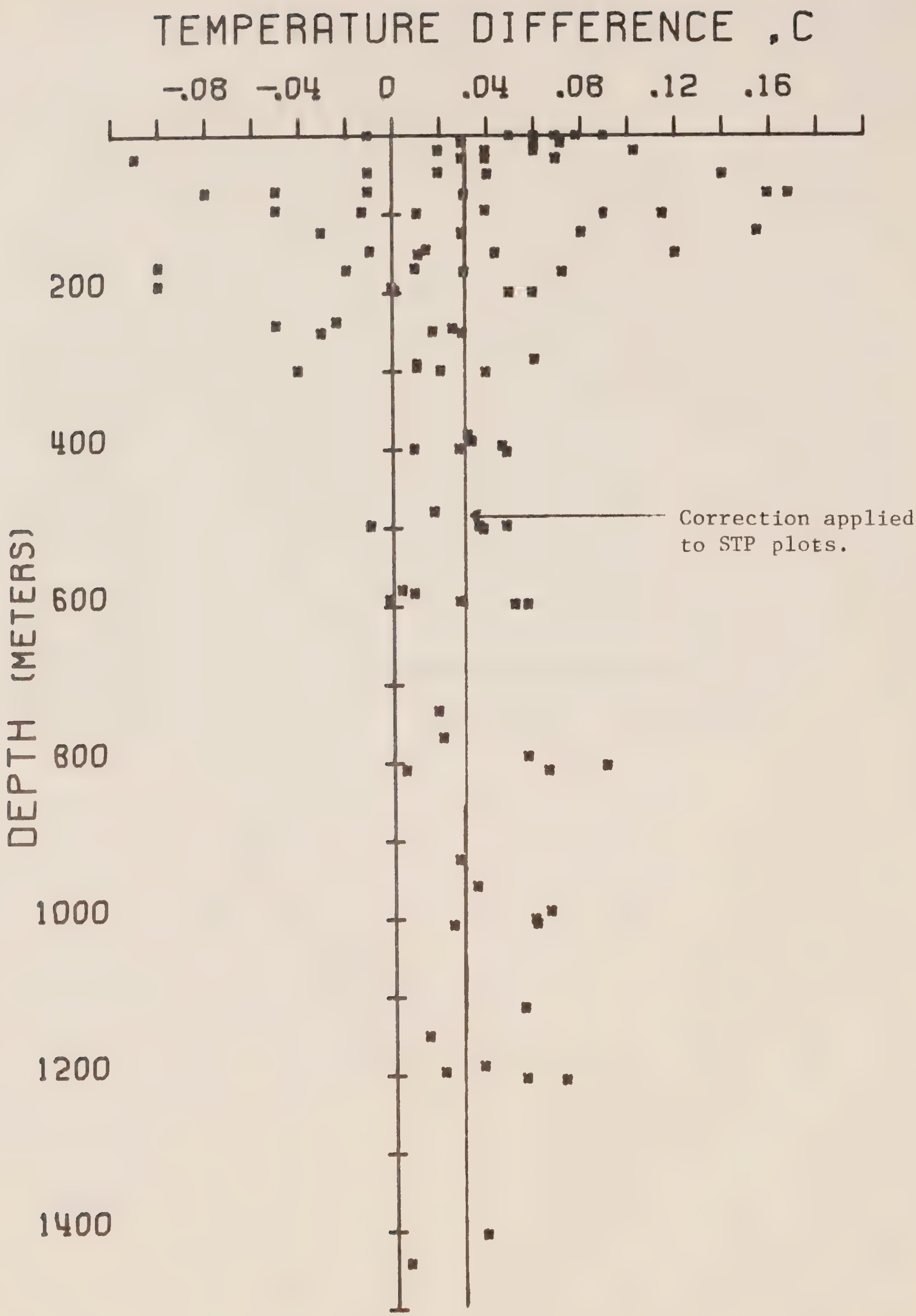
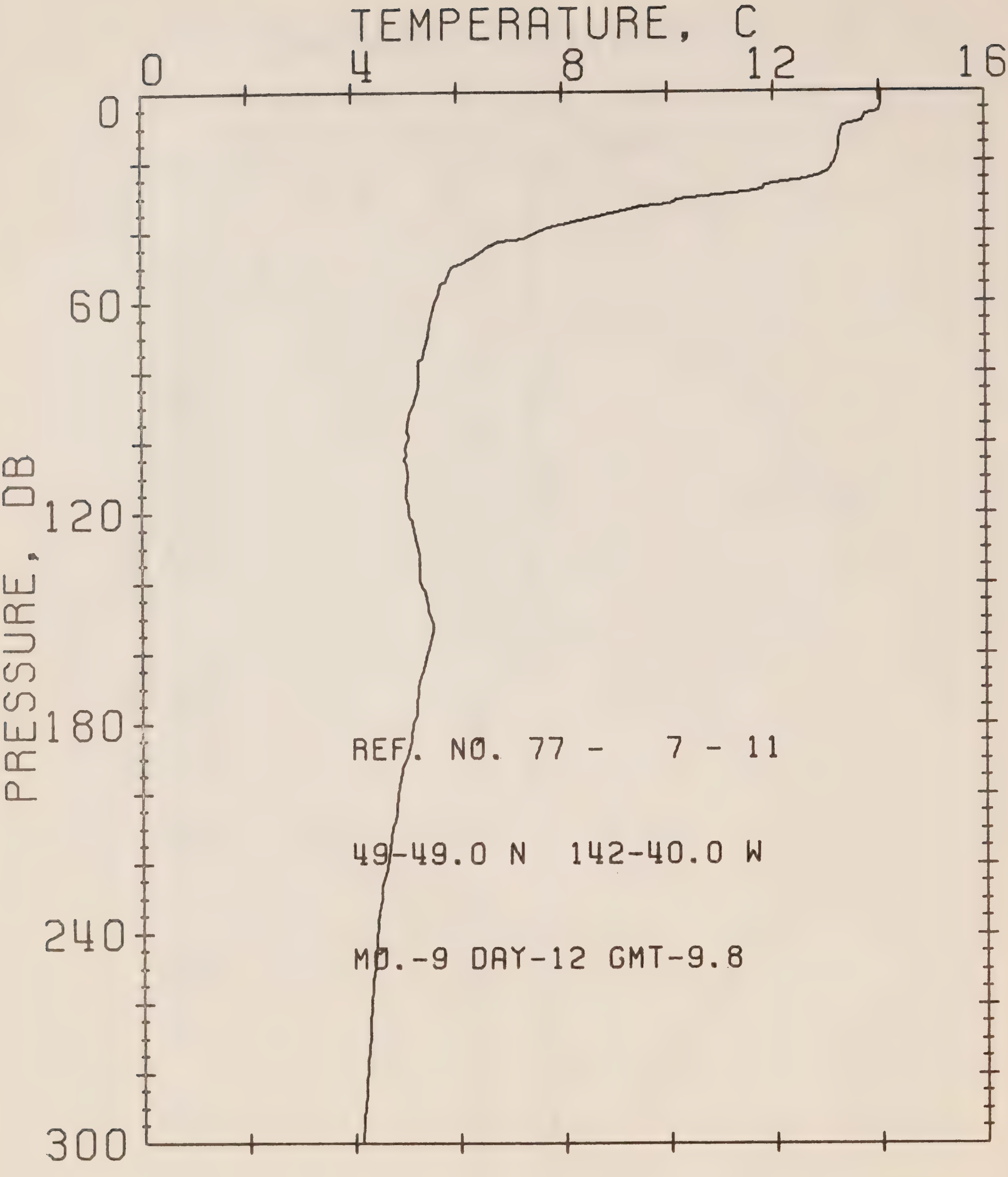
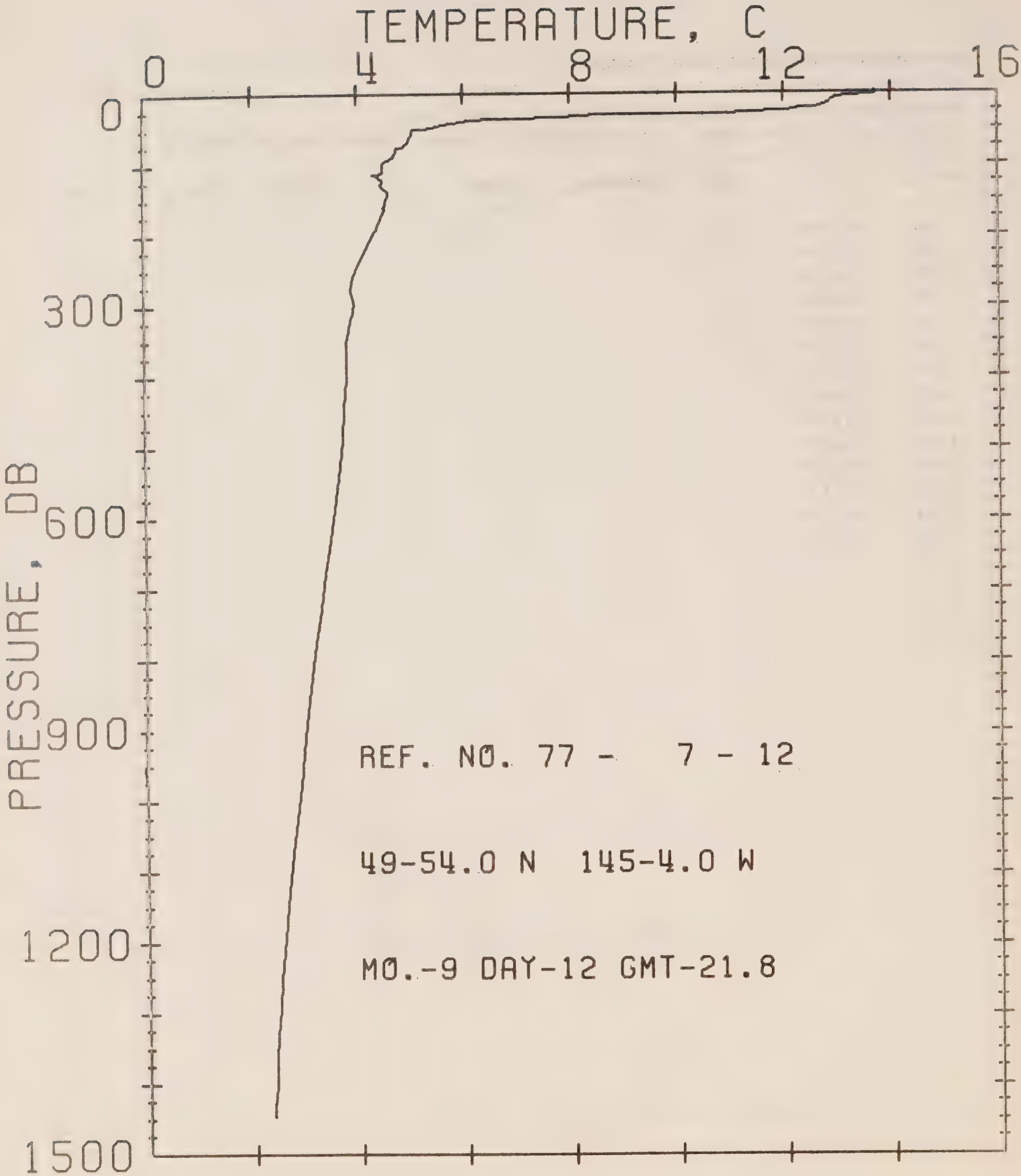


Figure 7. Temperature difference between hydro data and STP. P-77-7.


TEMPERATURE, C
0
4
8
12
16
PRESSURE, DB
0
60
120
180
240
300
REF. NO. 77 - 7 - 11
49-49.0 N 142-40.0 W
MO.-9 DAY-12 GMT-9.8

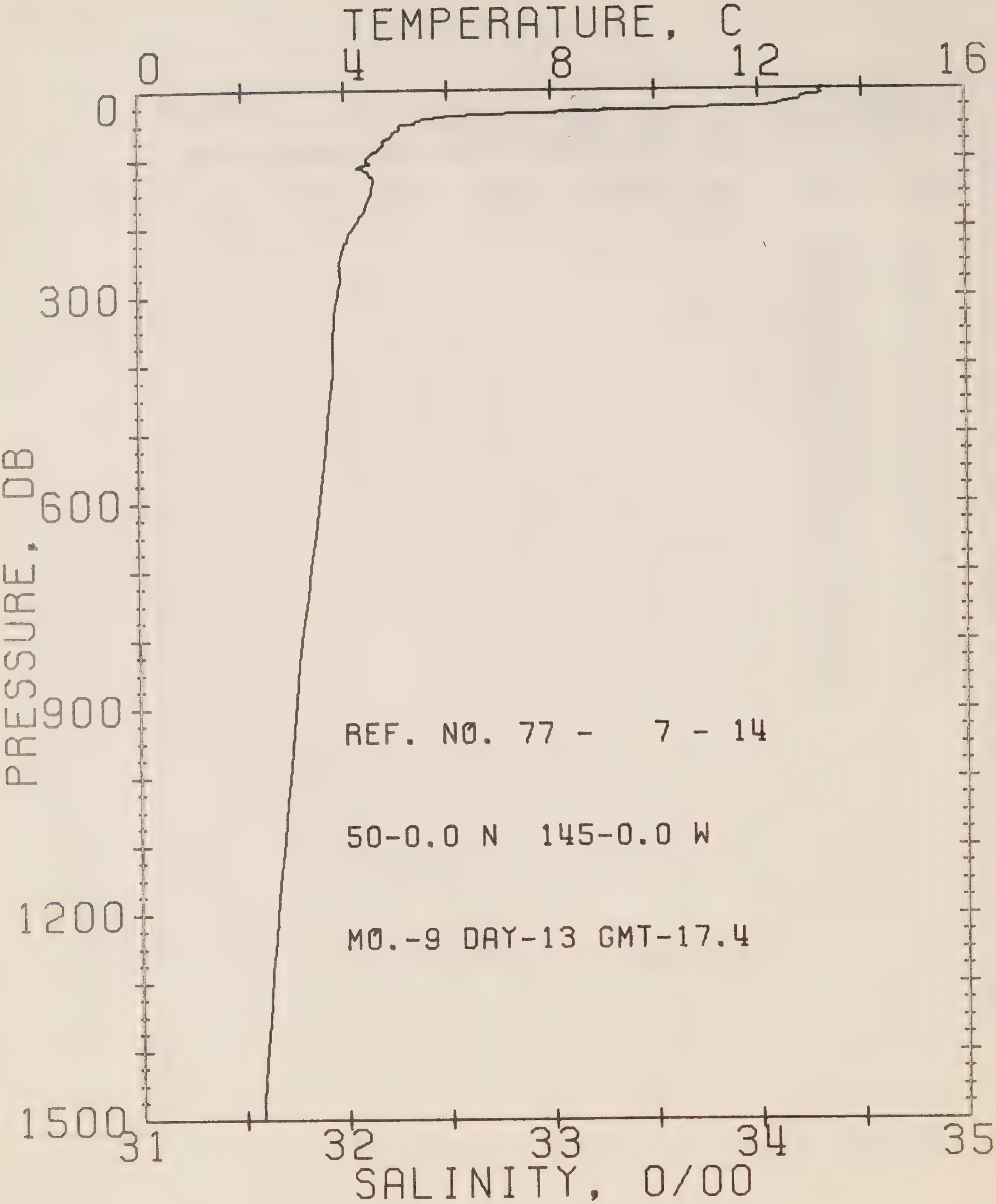
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 11 DATE 12/ 9/77 STATION 12
POSITION 49-49.0N. 142-40.0W GMT 9.8
RESULTS OF STP CAST 126 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	14.04							
10	13.34							
20	13.21							
30	10.84							
50	5.91							
75	5.38							
100	5.06							
125	5.17							
150	5.50							
175	5.22							
200	4.87							
225	4.58							
250	4.39							
300	4.13							


TEMPERATURE, C
0
4
8
12
16
PRESSURE, DB
0
300
600
900
1200
1500
REF. NO. 77 - 7 - 12
49-54.0 N 145-4.0 W
MO.-9 DAY-12 GMT-21.8

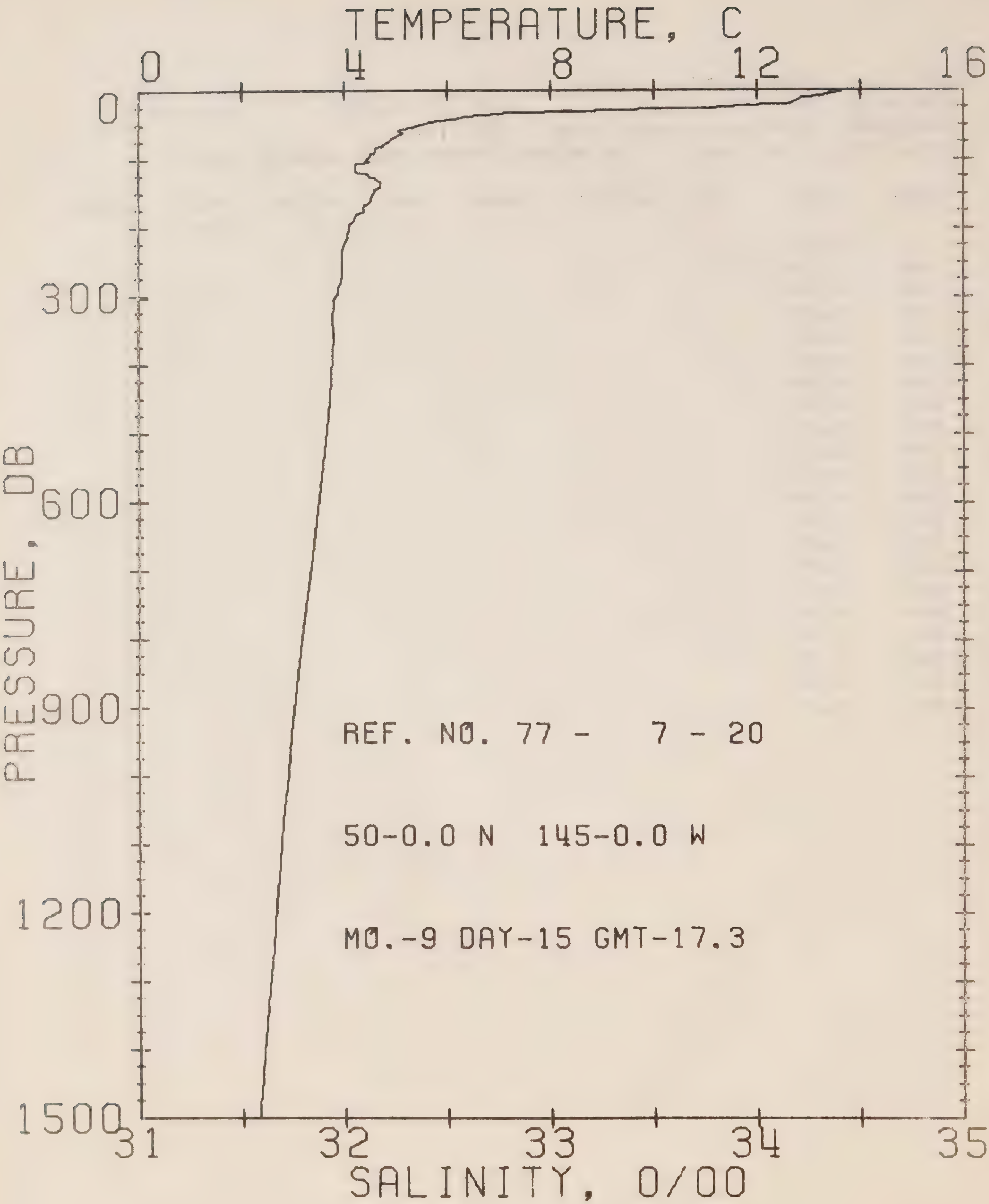
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 12 DATE 12/ 9/77 STATION P
POSITION 49-54.0N, 145- 4.0W GMT 21.8
RESULTS OF STP CAST 138 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.70							
10	12.96							
20	12.73							
30	10.75							
50	5.29							
75	4.89							
100	4.49							
125	4.48							
150	4.56							
175	4.46							
200	4.31							
225	4.14							
250	3.98							
300	3.94							
400	3.78							
500	3.69							
600	3.52							
800	3.14							
1000	2.84							
1200	2.54							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 14
50-0.0 N 145-0.0 W
MO.-9 DAY-13 GMT-17.4
31
32
33
34
35
SALINITY, O/OO

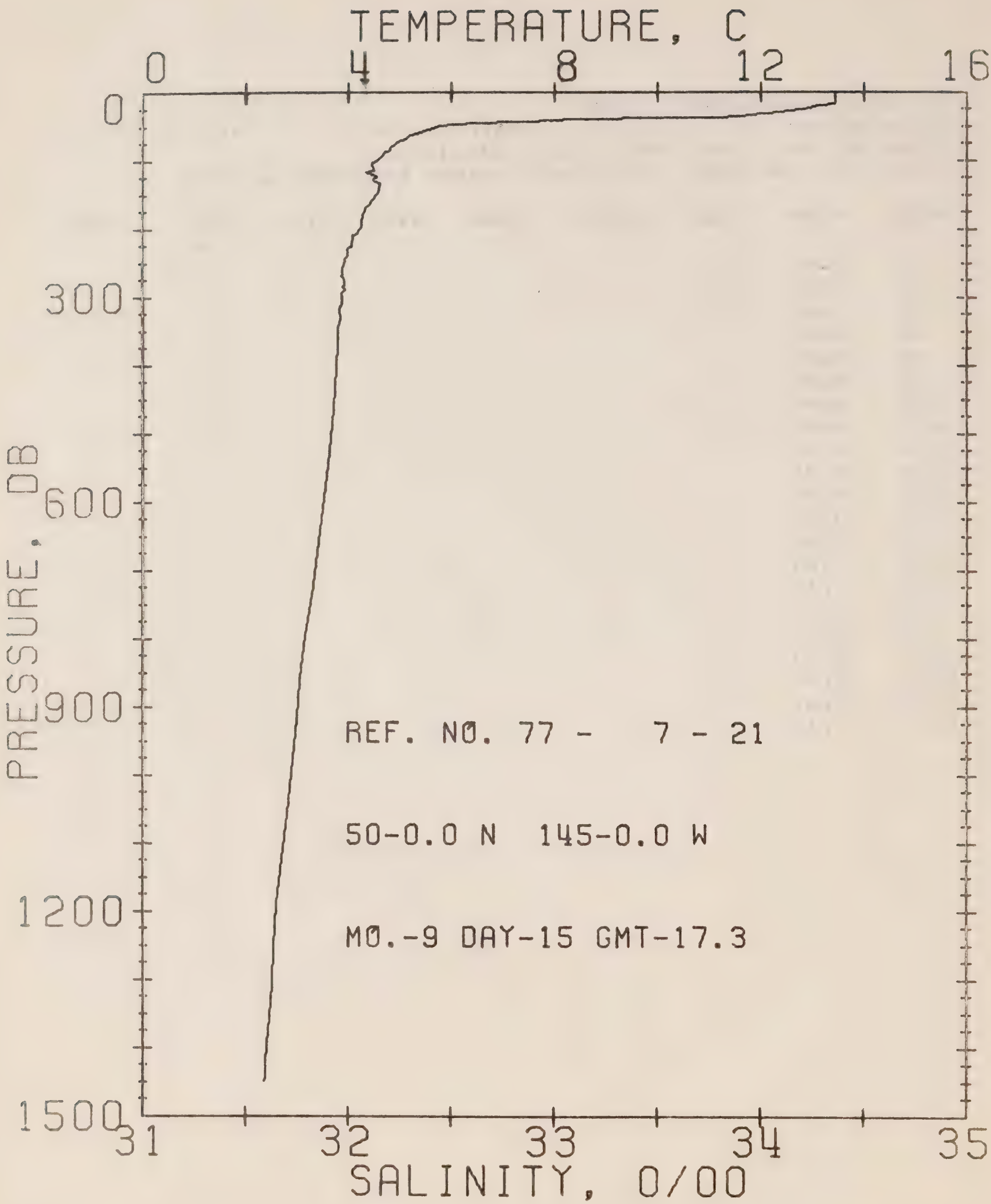
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 14 DATE 13/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.4
RESULTS OF STP CAST 173 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.26							
10	13.15							
20	12.56							
30	10.23							
50	5.35							
75	4.76							
100	4.44							
125	4.51							
150	4.53							
175	4.38							
200	4.17							
225	3.99							
250	3.90							
300	3.86							
400	3.75							
500	3.63							
600	3.48							
800	3.12							
1000	2.85							
1200	2.60							
1500	2.28							


TEMPERATURE, C
0
4
8
12
16
PRESSURE, DB
0
300
600
900
1200
1500
REF. NO. 77 - 7 - 20
50-0.0 N 145-0.0 W
MO.-9 DAY-15 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

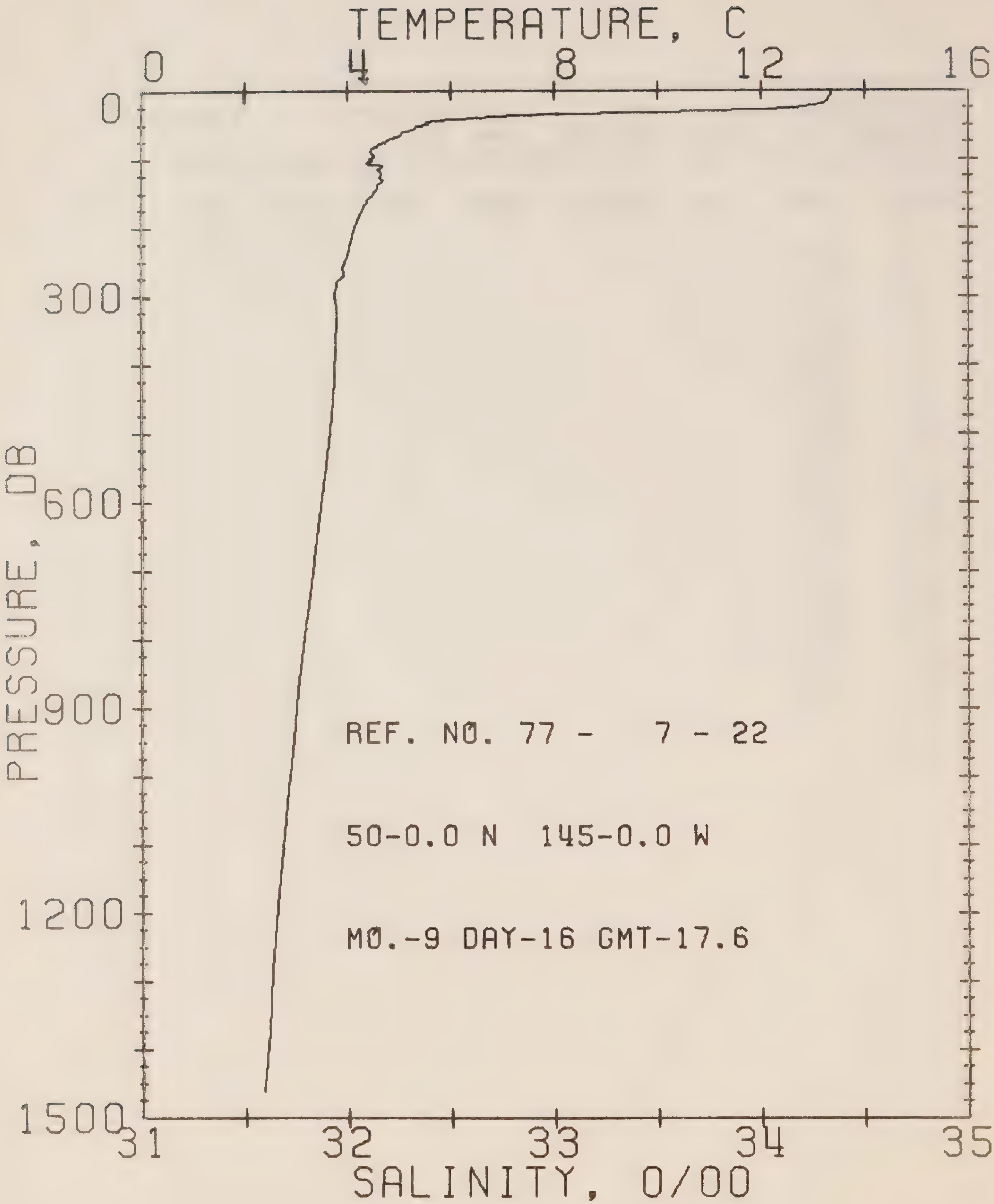
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 20 DATE 15/ 9/77 STATION P
POSITION 50- 0.0N. 145- 0.0W GMT 17.3
RESULTS OF STP CAST 146 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.55							
10	12.91							
20	12.62							
30	8.52							
50	5.53							
75	4.85							
100	4.44							
125	4.48							
150	4.55							
175	4.37							
200	4.09							
225	3.99							
250	3.95							
300	3.83							
400	3.76							
500	3.64							
600	3.48							
800	3.13							
1000	2.85							
1200	2.61							
1500	2.30							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NØ. 77 - 7 - 21
50-0.0 N 145-0.0 W
MØ.-9 DAY-15 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

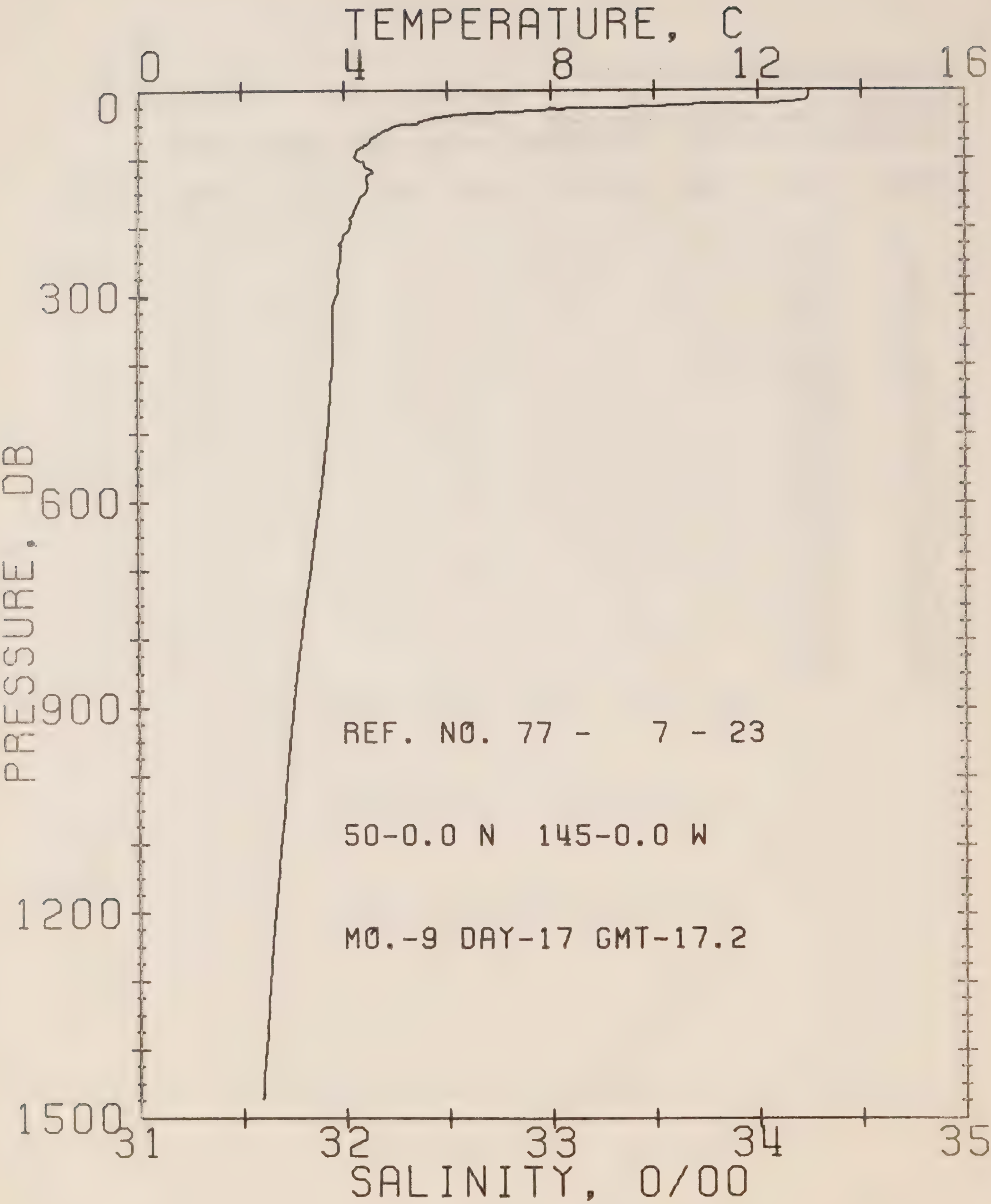
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 21 DATE 15/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 152 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.44							
10	13.45							
20	13.06							
30	12.14							
50	5.70							
75	4.91							
100	4.53							
125	4.51							
150	4.52							
175	4.29							
200	4.19							
225	4.02							
250	3.90							
300	3.88							
400	3.76							
500	3.66							
600	3.49							
800	3.14							
1000	2.86							
1200	2.57							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 22
50-0.0 N 145-0.0 W
MO.-9 DAY-16 GMT-17.6
31
32
33
34
35
SALINITY, 0/00

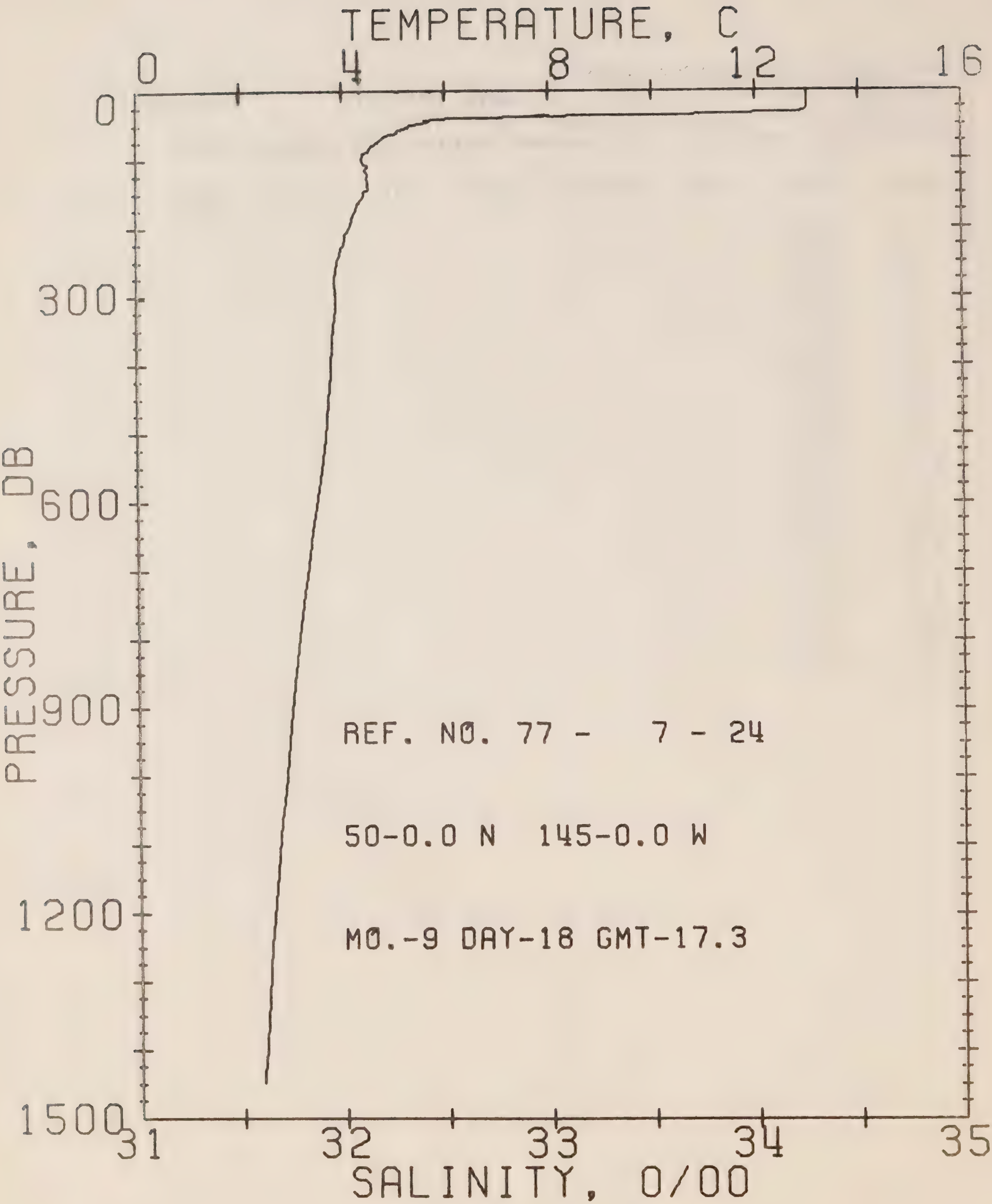
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 22 DATE 16/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.6
RESULTS OF STP CAST 139 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.37							
10	13.32							
20	13.19							
30	11.12							
50	5.55							
75	4.73							
100	4.43							
125	4.62							
150	4.50							
175	4.26							
200	4.12							
225	4.03							
250	3.93							
300	3.74							
400	3.74							
500	3.64							
600	3.47							
800	3.12							
1000	2.83							
1200	2.58							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 23
50-0.0 N 145-0.0 W
MO.-9 DAY-17 GMT-17.2
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 23 DATE 17/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 129 POINTS TAKEN FROM ANALOG TRACE

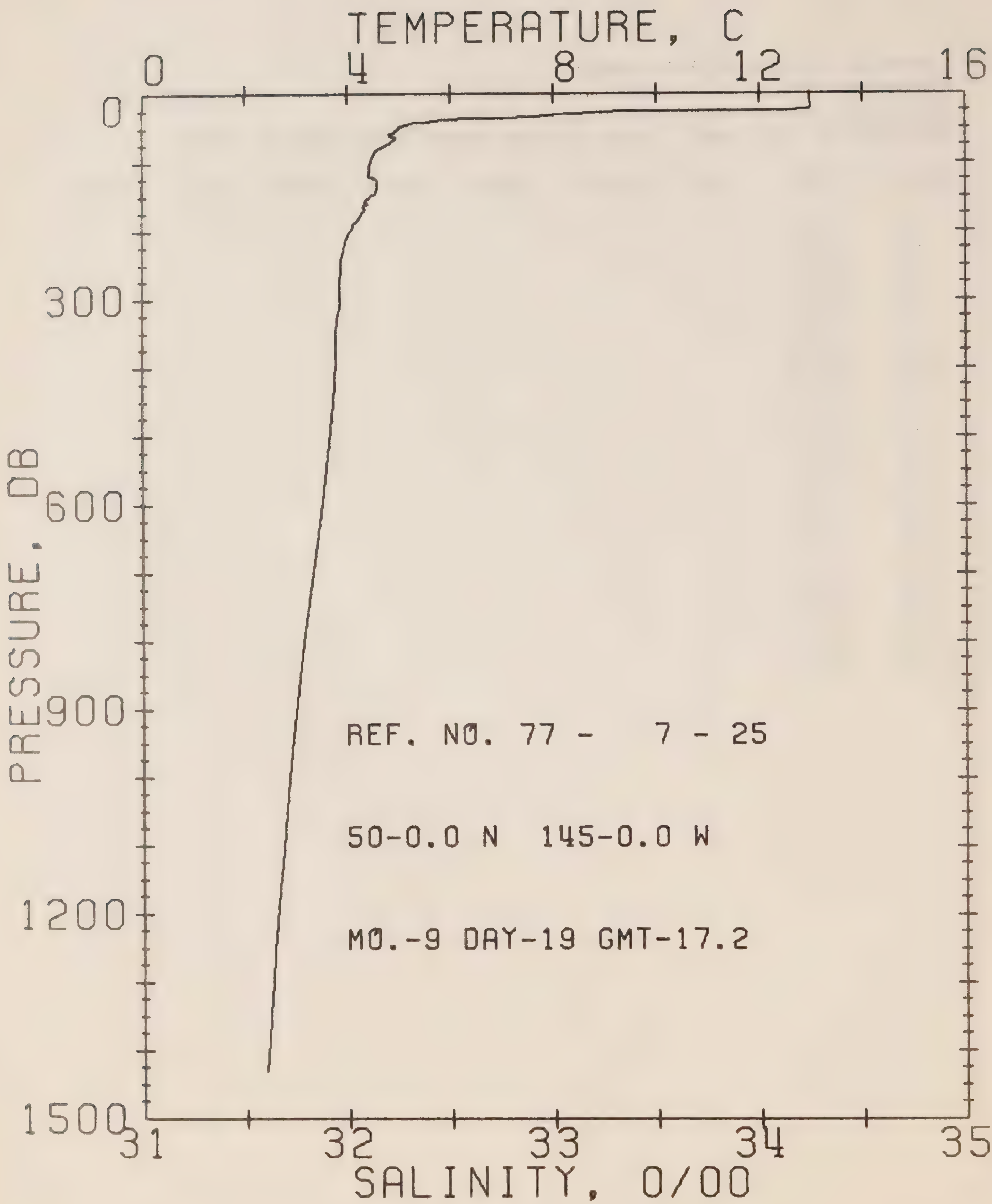
PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.98							
10	12.98							
20	12.23							
30	7.74							
50	5.40							
75	4.50							
100	4.23							
125	4.44							
150	4.39							
175	4.20							
200	4.09							
225	3.90							
250	3.91							
300	3.85							
400	3.75							
500	3.64							
600	3.48							
800	3.13							
1000	2.83							
1200	2.59							



TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 24
50-0.0 N 145-0.0 W
MO.-9 DAY-18 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 24 DATE 18/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 125 POINTS TAKEN FROM ANALOG TRACE

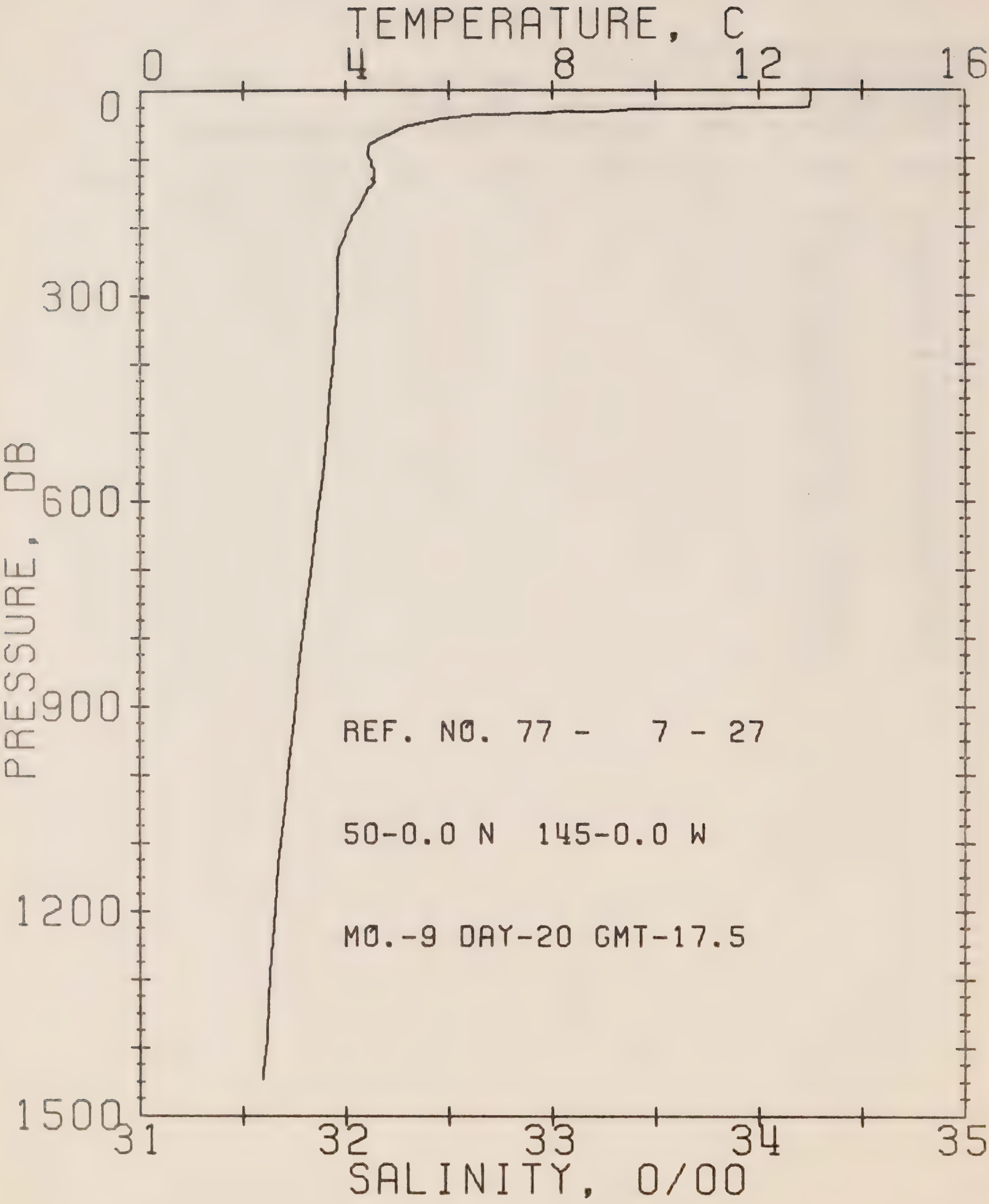
PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.02							
10	13.02							
20	13.02							
30	12.95							
50	5.44							
75	4.68							
100	4.38							
125	4.48							
150	4.42							
175	4.25							
200	4.12							
225	4.01							
250	3.90							
300	3.87							
400	3.76							
500	3.65							
600	3.47							
800	3.10							
1000	2.83							
1200	2.57							



TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 25
50-0.0 N 145-0.0 W
MO.-9 DAY-19 GMT-17.2
31
32
33
34
35
SALINITY, 0/00

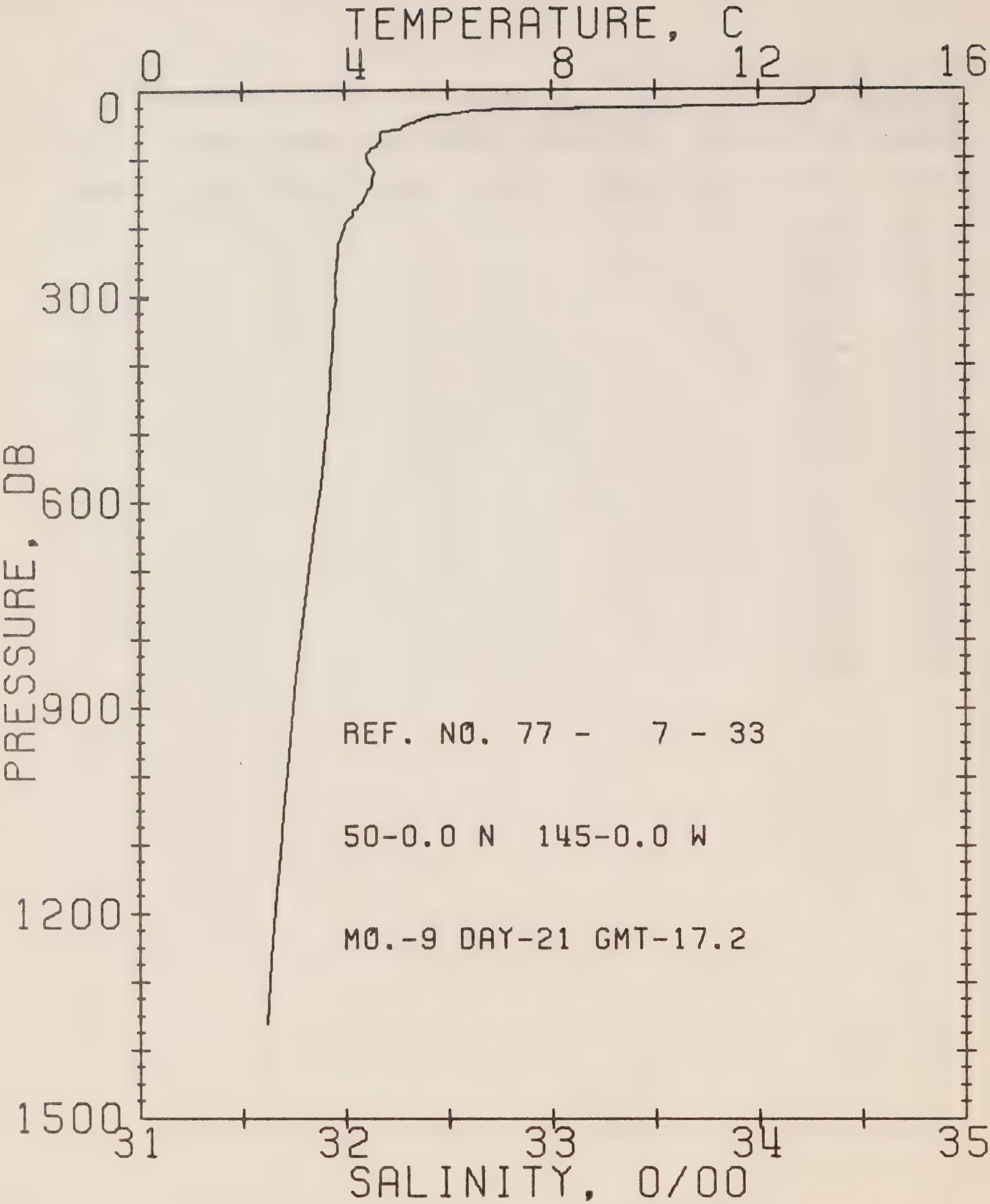
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 25 DATE 19/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 128 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.99							
10	12.99							
20	13.00							
30	8.29							
50	5.00							
75	4.76							
100	4.45							
125	4.56							
150	4.48							
175	4.27							
200	4.05							
225	3.91							
250	3.87							
300	3.85							
400	3.74							
500	3.63							
600	3.47							
800	3.12							
1000	2.82							
1200	2.57							


TEMPERATURE, C
0
4
8
12
16
PRESSURE, DB
0
300
600
900
1200
1500
REF. NO. 77 - 7 - 27
50-0.0 N 145-0.0 W
MO.-9 DAY-20 GMT-17.5
31
32
33
34
35
SALINITY, O/OO

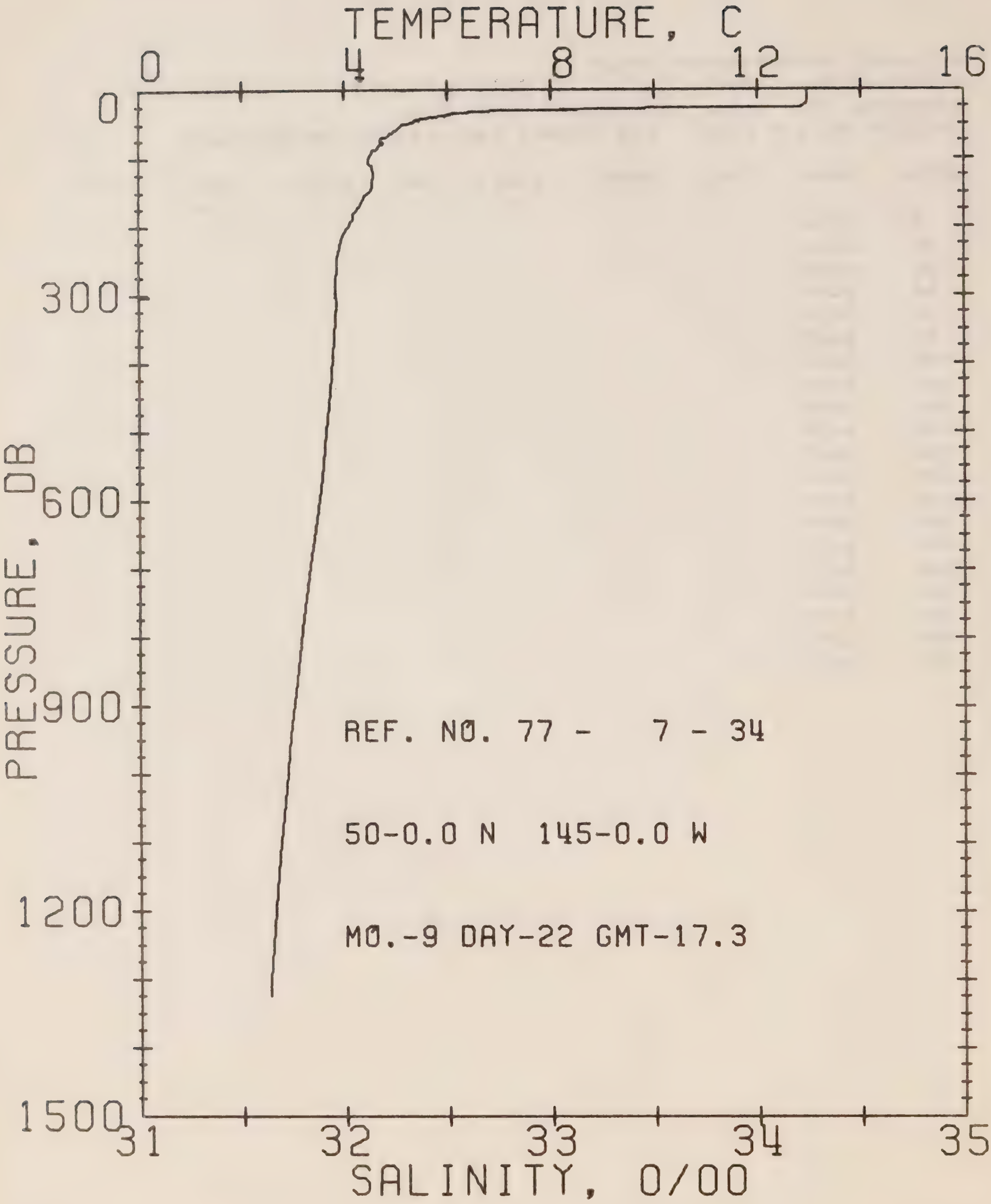
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 27 DATE 20/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.5
RESULTS OF STP CAST 122 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.84							
10	13.00							
20	12.99							
30	9.45							
50	5.41							
75	4.57							
100	4.49							
125	4.57							
150	4.40							
175	4.21							
200	4.04							
225	3.90							
250	3.83							
300	3.86							
400	3.74							
500	3.63							
600	3.47							
800	3.14							
1000	2.84							
1200	2.59							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 33
50-0.0 N 145-0.0 W
MO.-9 DAY-21 GMT-17.2
31
32
33
34
35
SALINITY, 0/00

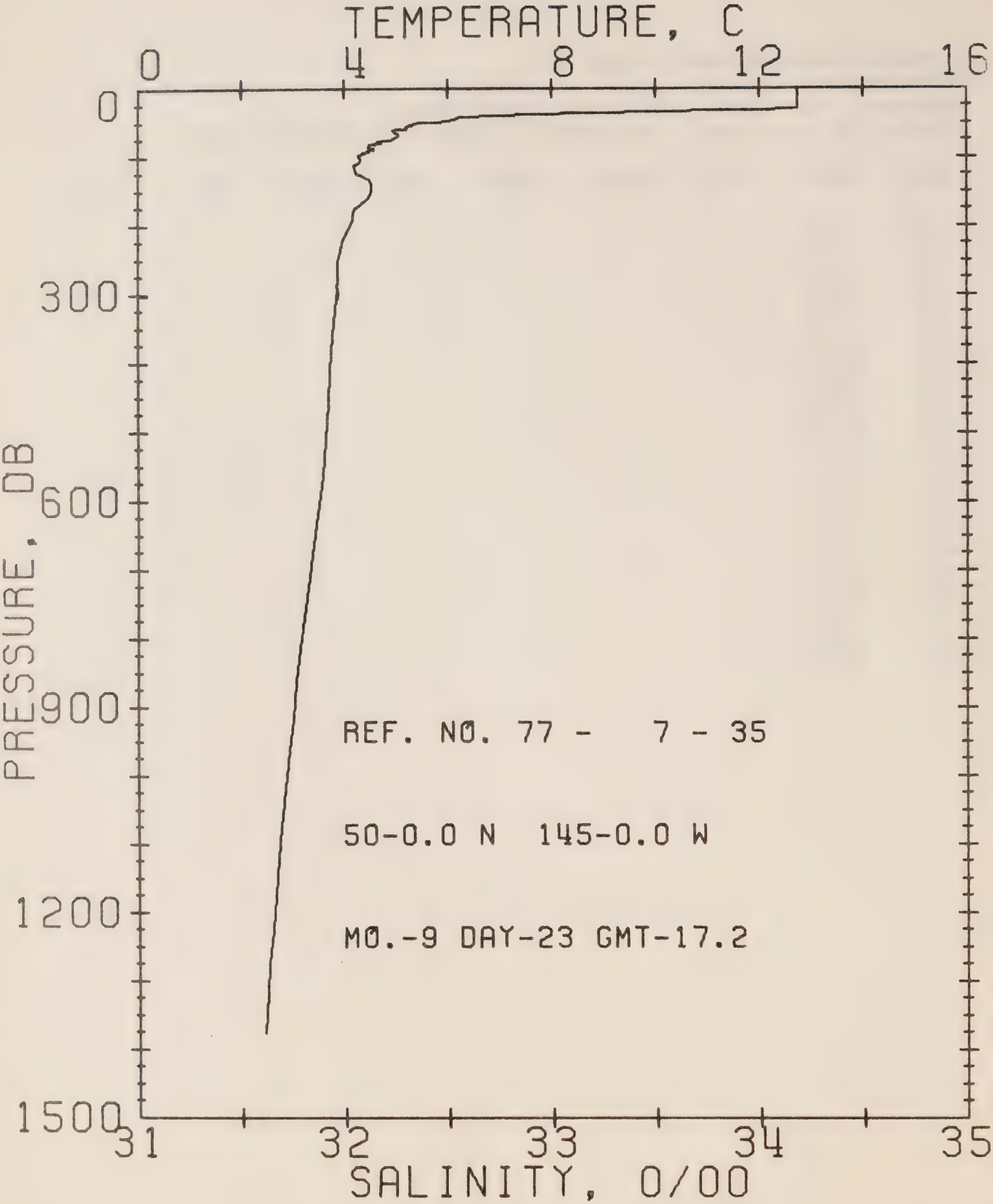
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 33 DATE 21/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 128 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	13.10							
10	13.10							
20	13.00							
30	6.85							
50	5.24							
75	4.67							
100	4.44							
125	4.53							
150	4.42							
175	4.20							
200	3.99							
225	3.88							
250	3.85							
300	3.82							
400	3.73							
500	3.62							
600	3.45							
800	3.09							
1000	2.82							
1200	2.58							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 34
50-0.0 N 145-0.0 W
MO.-9 DAY-22 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

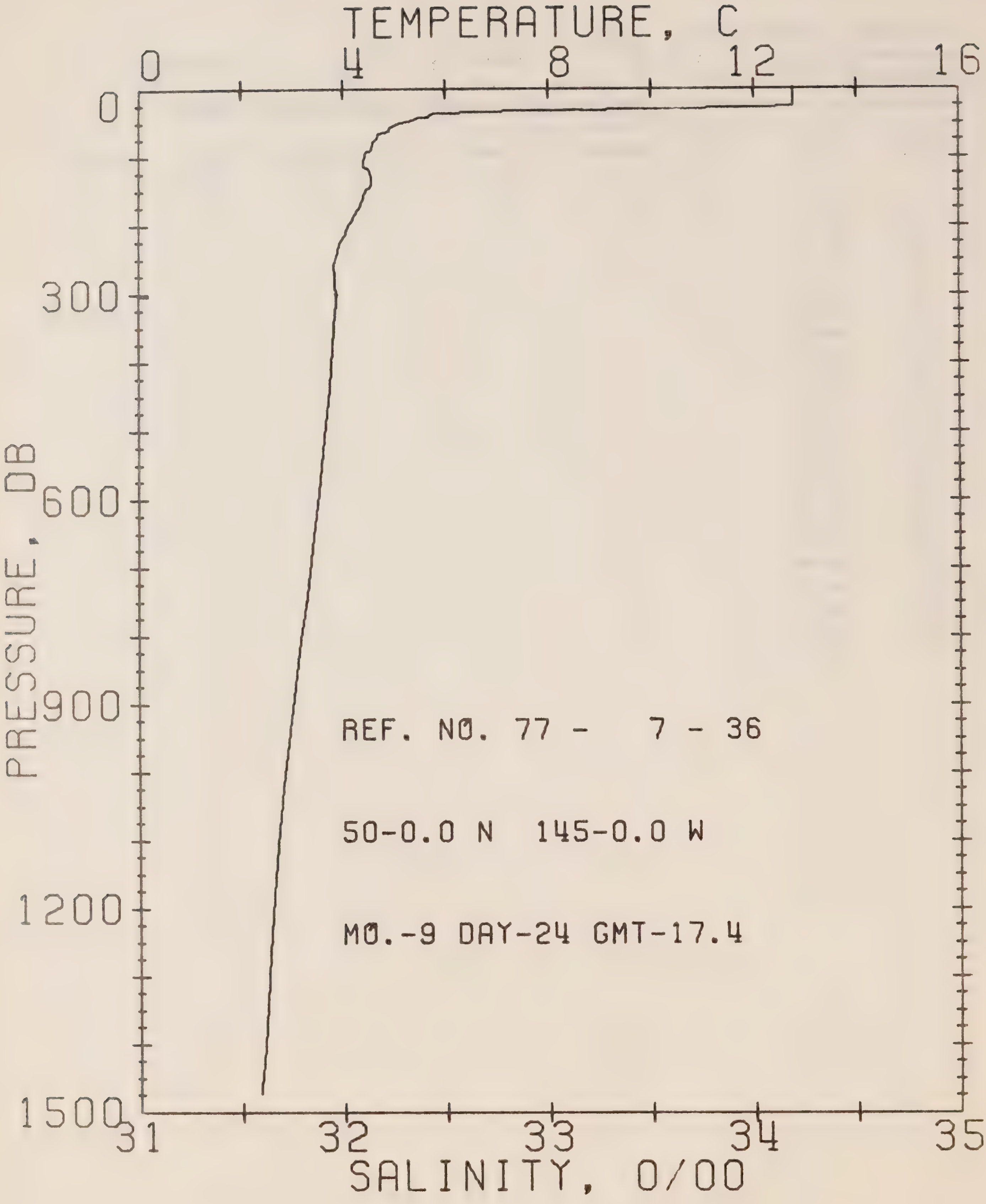
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 34 DATE 22/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 107 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.95							
10	12.95							
20	12.94							
30	8.01							
50	5.22							
75	4.70							
100	4.46							
125	4.56							
150	4.45							
175	4.21							
200	4.07							
225	3.90							
250	3.84							
300	3.81							
400	3.74							
500	3.63							
600	3.47							
800	3.11							
1000	2.83							
1200	2.60							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 35
50-0.0 N 145-0.0 W
MO.-9 DAY-23 GMT-17.2
31
32
33
34
35
SALINITY, 0/00

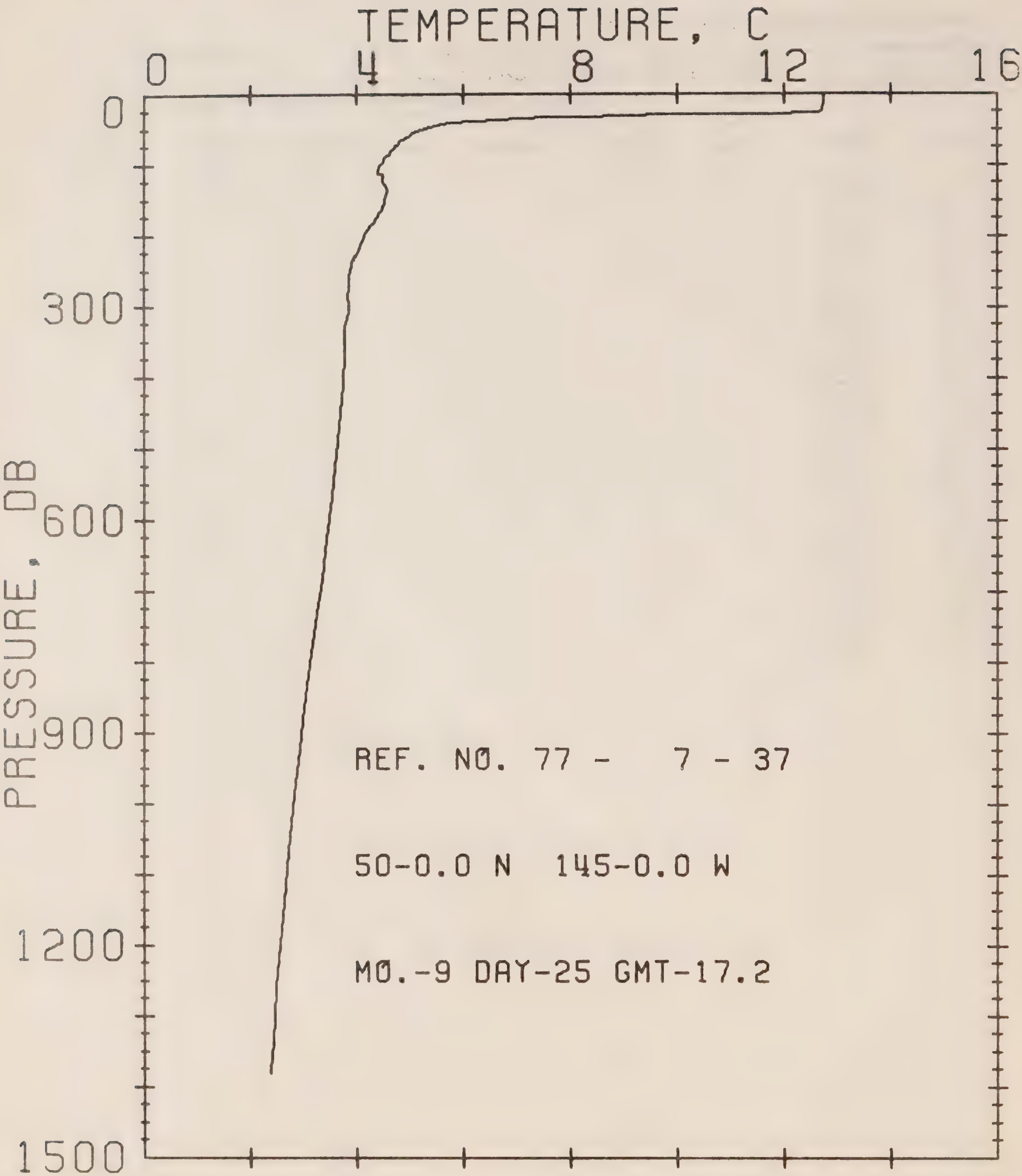
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 35 DATE 23/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 136 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.74							
10	12.75							
20	12.75							
30	12.75							
50	5.76							
75	4.88							
100	4.29							
125	4.27							
150	4.52							
175	4.22							
200	4.09							
225	3.95							
250	3.88							
300	3.86							
400	3.73							
500	3.63							
600	3.49							
800	3.13							
1000	2.83							
1200	2.58							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 36
50-0.0 N 145-0.0 W
MO.-9 DAY-24 GMT-17.4
31
32
33
34
35
SALINITY, 0/00

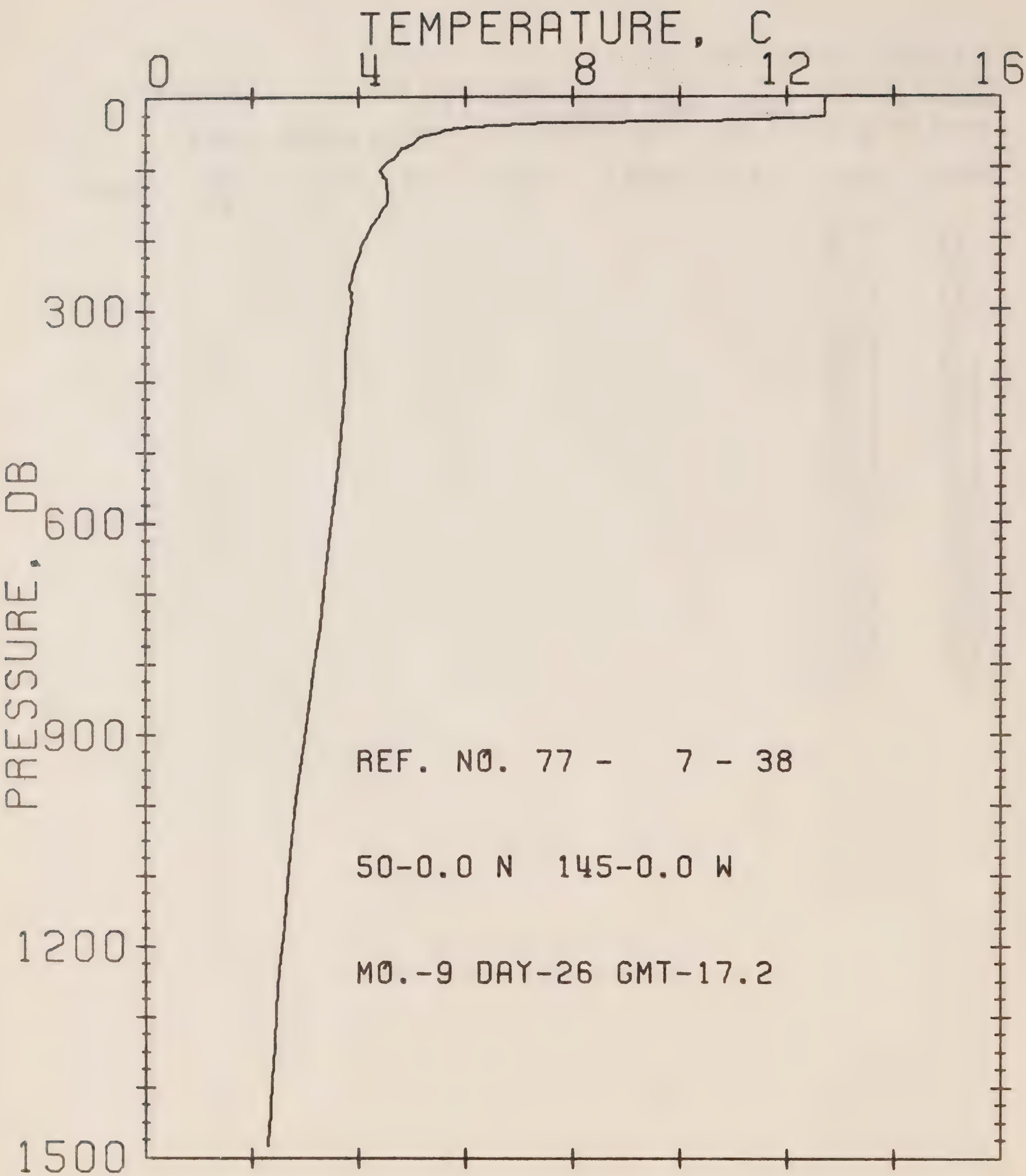
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 36 DATE 24/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.4
RESULTS OF STP CAST 111 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.78							
10	12.78							
20	12.78							
30	10.58							
50	5.20							
75	4.63							
100	4.42							
125	4.55							
150	4.45							
175	4.31							
200	4.10							
225	3.93							
250	3.83							
300	3.86							
400	3.77							
500	3.64							
600	3.49							
800	3.15							
1000	2.82							
1200	2.58							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NØ. 77 - 7 - 37
50-0.0 N 145-0.0 W
MØ.-9 DAY-25 GMT-17.2

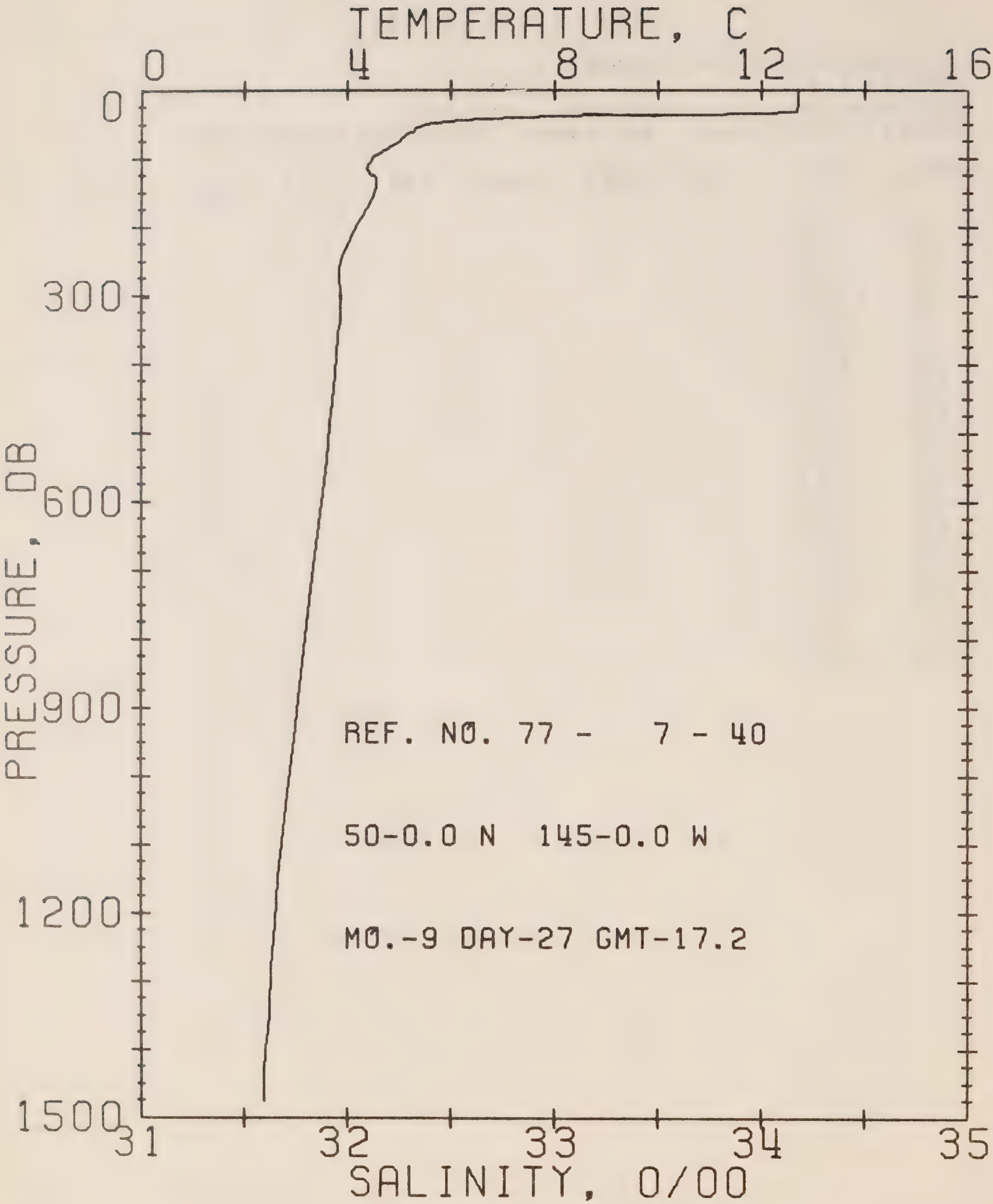
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 37 DATE 25/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 114 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.75							
10	12.75							
20	12.73							
30	9.42							
50	5.23							
75	4.73							
100	4.46							
125	4.50							
150	4.54							
175	4.40							
200	4.16							
225	4.04							
250	4.01							
300	3.87							
400	3.76							
500	3.65							
600	3.49							
800	3.12							
1000	2.82							
1200	2.55							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 38
50-0.0 N 145-0.0 W
MO.-9 DAY-26 GMT-17.2

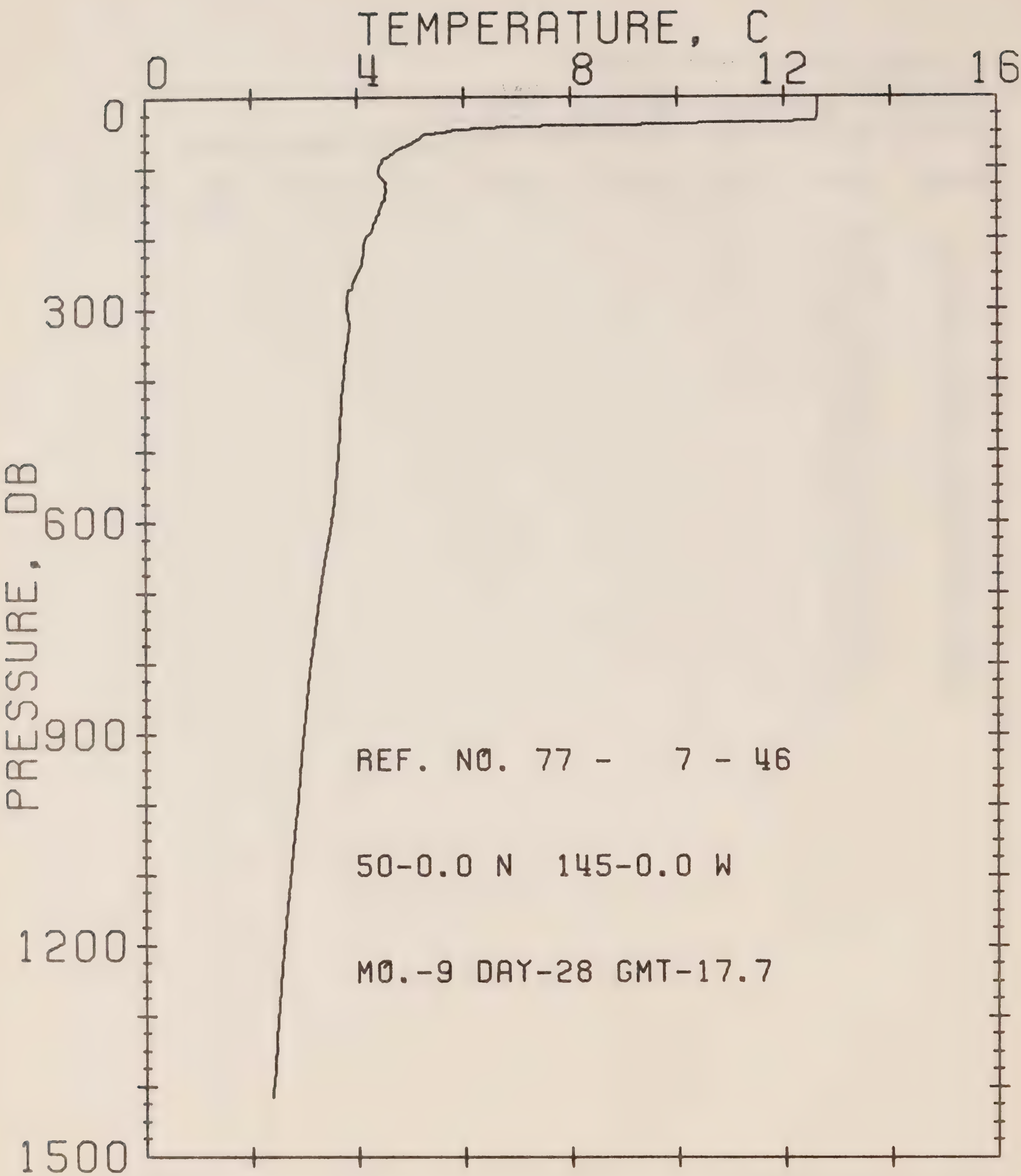
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 38 DATE 26/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 122 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.74							
10	12.73							
20	12.72							
30	12.43							
50	5.53							
75	4.81							
100	4.45							
125	4.53							
150	4.54							
175	4.35							
200	4.15							
225	4.03							
250	3.91							
300	3.88							
400	3.75							
500	3.65							
600	3.50							
800	3.18							
1000	2.83							
1200	2.57							


TEMPERATURE, C
0
4
8
12
16
PRESSURE, DB
0
300
600
900
1200
1500
REF. NO. 77 - 7 - 40
50-0.0 N 145-0.0 W
MO.-9 DAY-27 GMT-17.2
31
32
33
34
35
SALINITY, 0/00

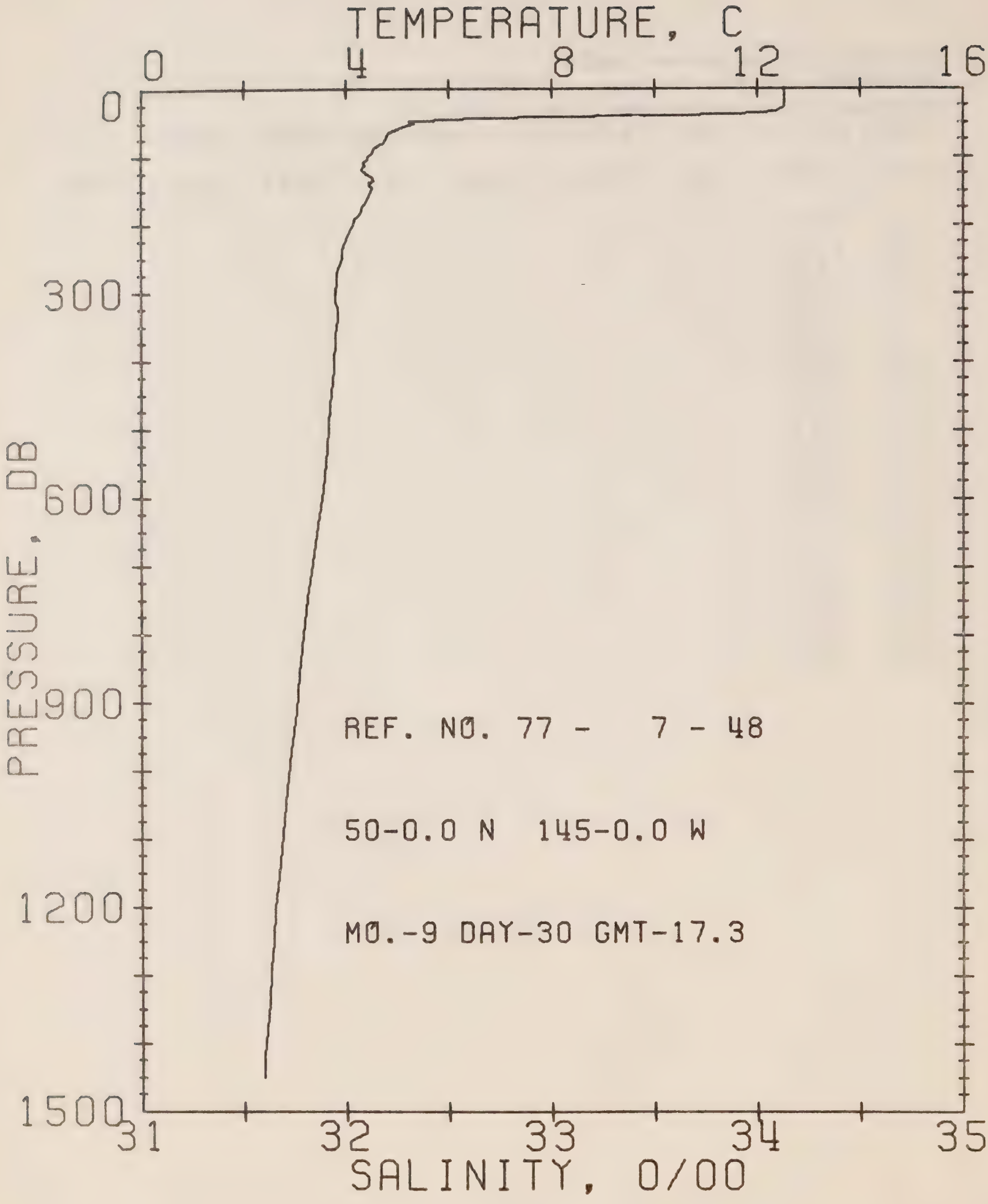
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 40 DATE 27/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 114 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.71							
10	12.71							
20	12.71							
30	12.69							
50	5.59							
75	5.00							
100	4.47							
125	4.53							
150	4.51							
175	4.36							
200	4.15							
225	4.01							
250	3.86							
300	3.86							
400	3.77							
500	3.63							
600	3.48							
800	3.15							
1000	2.85							
1200	2.58							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 46
50-0.0 N 145-0.0 W
MO.-9 DAY-28 GMT-17.7

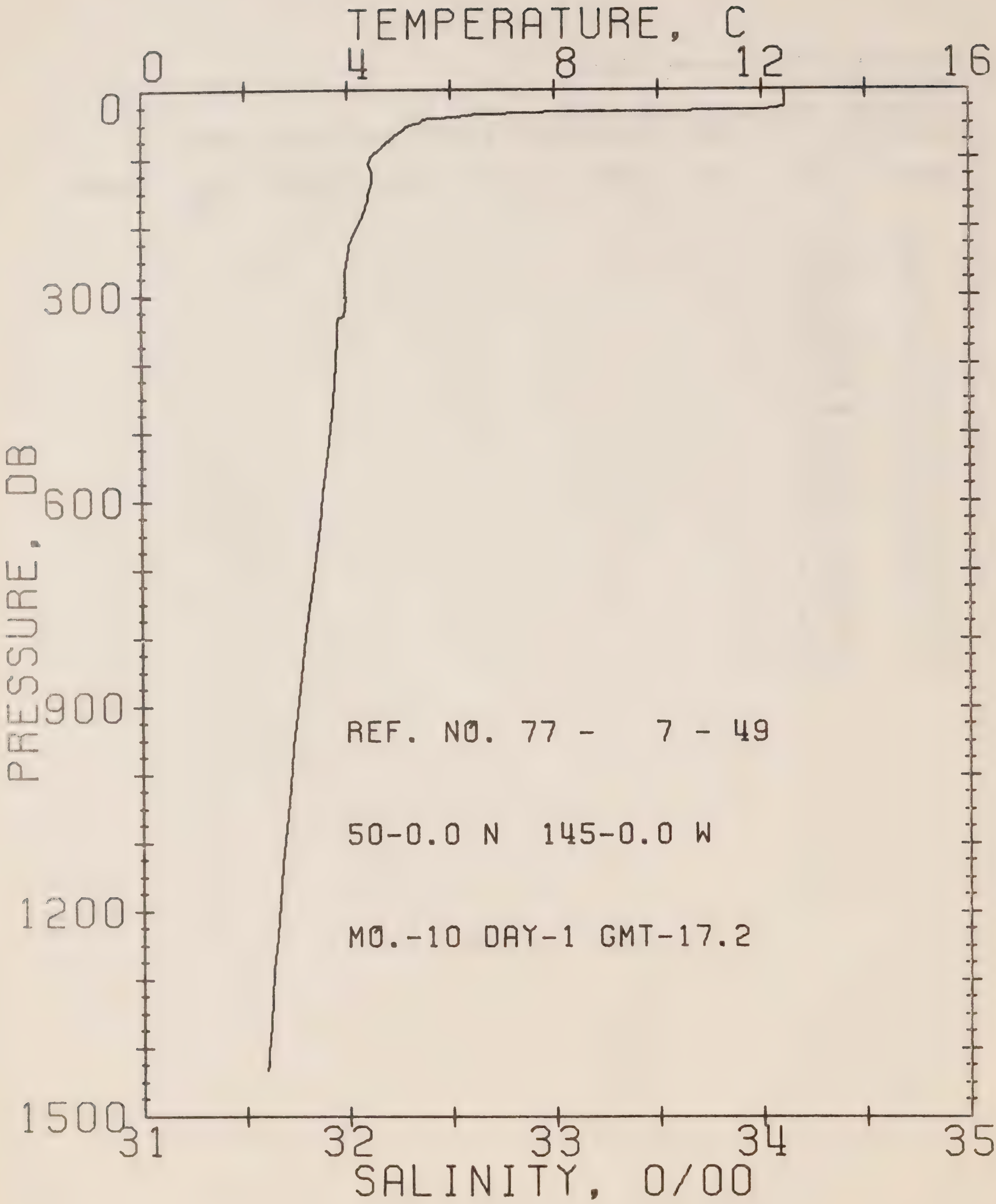
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 46 DATE 28/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.7
RESULTS OF STP CAST 125 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.62							
10	12.65							
20	12.65							
30	12.64							
50	5.55							
75	4.78							
100	4.44							
125	4.54							
150	4.50							
175	4.37							
200	4.19							
225	4.12							
250	4.03							
300	3.81							
400	3.74							
500	3.65							
600	3.51							
800	3.12							
1000	2.86							
1200	2.60							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NØ. 77 - 7 - 48
50-0.0 N 145-0.0 W
MØ.-9 DAY-30 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

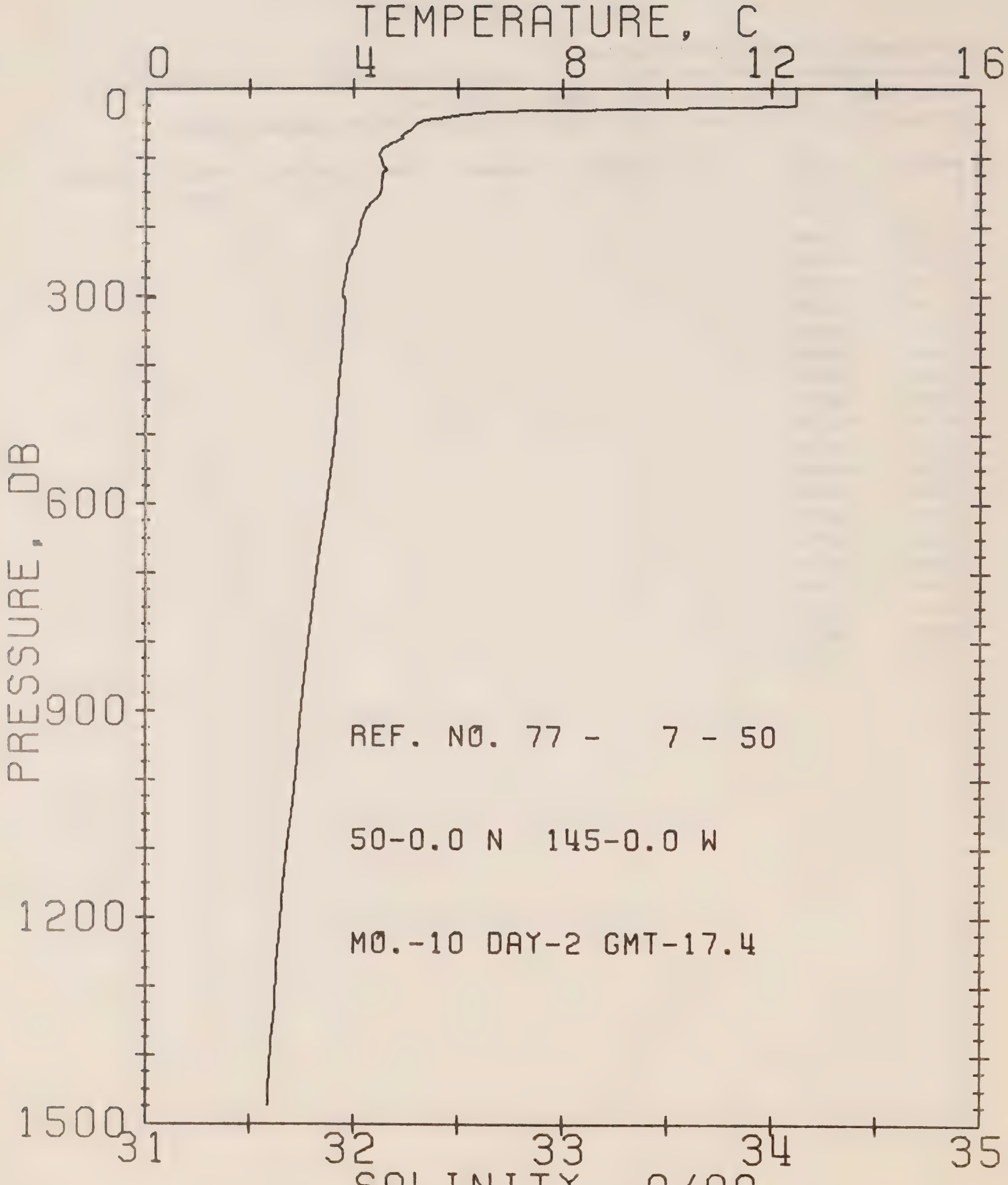
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 48 DATE 30/ 9/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 115 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.53							
10	12.53							
20	12.53							
30	12.47							
50	5.26							
75	4.75							
100	4.44							
125	4.39							
150	4.48							
175	4.30							
200	4.12							
225	3.98							
250	3.90							
300	3.78							
400	3.77							
500	3.65							
600	3.51							
800	3.14							
1000	2.86							
1200	2.58							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 49
50-0.0 N 145-0.0 W
MO.-10 DAY-1 GMT-17.2
31
32
33
34
35
SALINITY, 0/00

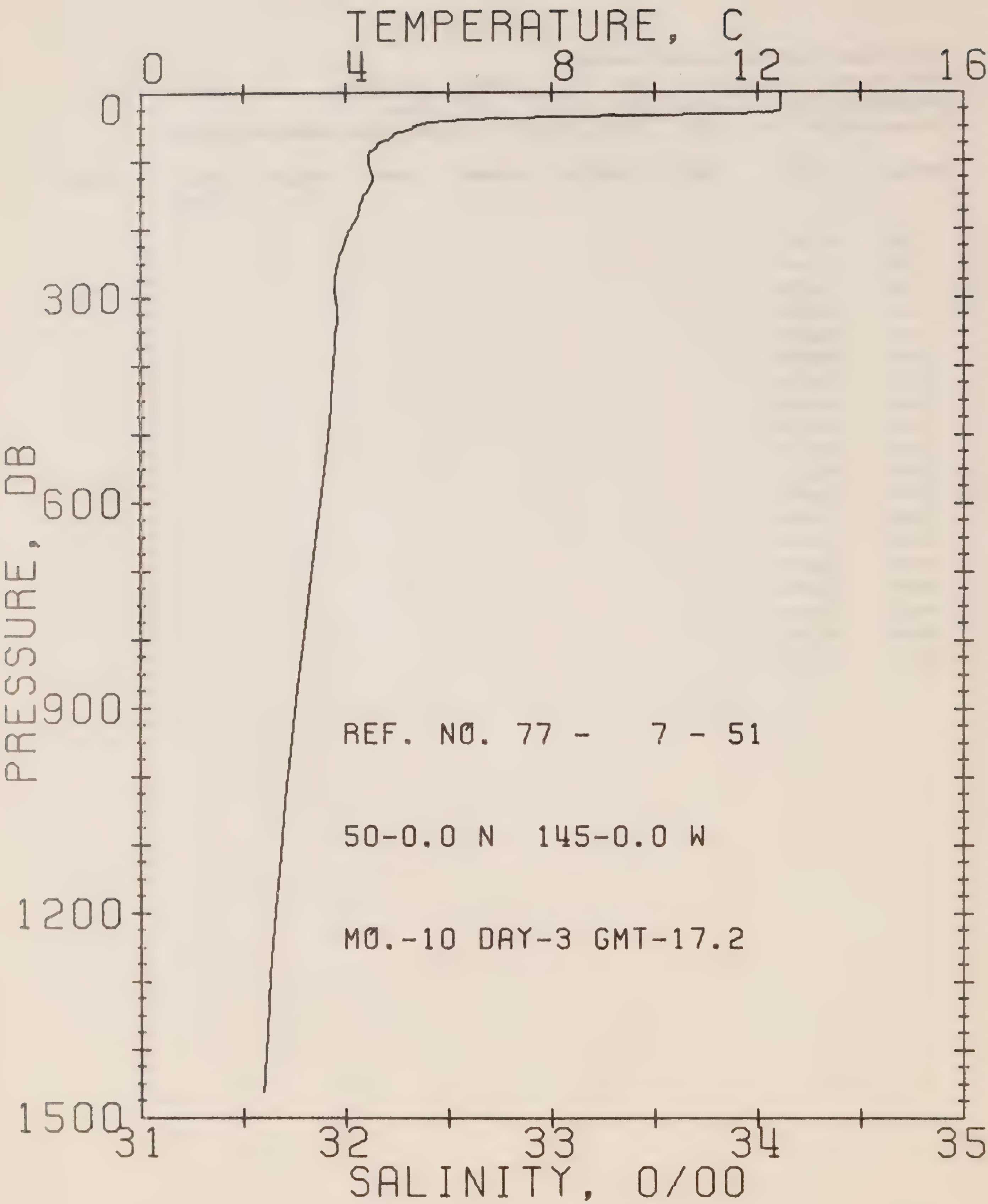
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 49 DATE 1/10/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 113 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.44							
10	12.44							
20	12.44							
30	12.04							
50	5.38							
75	4.82							
100	4.45							
125	4.49							
150	4.42							
175	4.32							
200	4.18							
225	4.04							
250	3.97							
300	3.94							
400	3.73							
500	3.60							
600	3.44							
800	3.10							
1000	2.82							
1200	2.57							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 50
50-0.0 N 145-0.0 W
MO.-10 DAY-2 GMT-17.4
31
32
33
34
35
SALINITY, 0/00

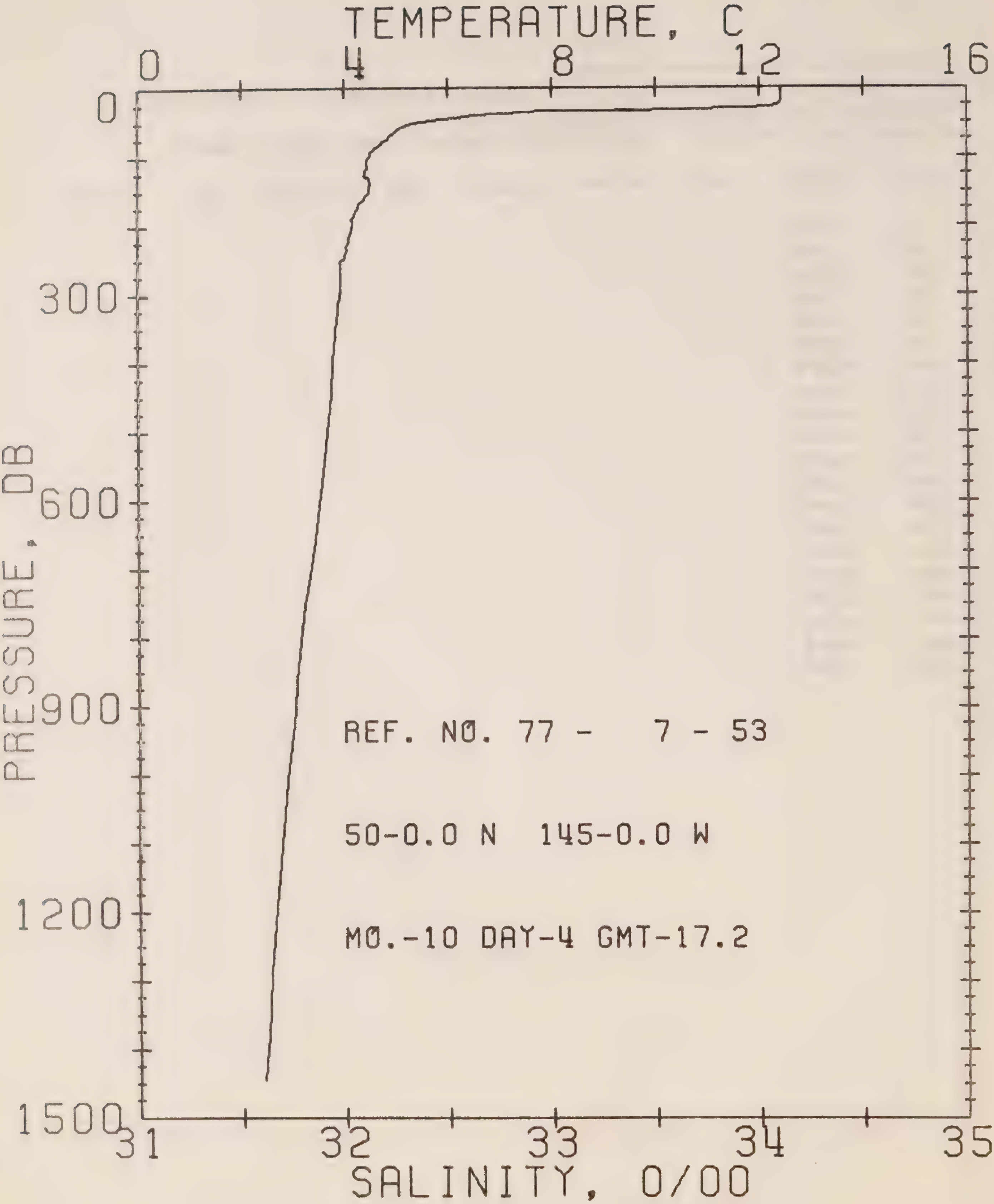
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 50 DATE 2/10/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.4
RESULTS OF STP CAST 124 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.49							
10	12.49							
20	12.48							
30	9.59							
50	5.26							
75	4.88							
100	4.52							
125	4.55							
150	4.51							
175	4.24							
200	4.12							
225	4.03							
250	3.89							
300	3.80							
400	3.72							
500	3.59							
600	3.44							
800	3.08							
1000	2.82							
1200	2.54							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 51
50-0.0 N 145-0.0 W
MO.-10 DAY-3 GMT-17.2
31
32
33
34
35
SALINITY, 0/00

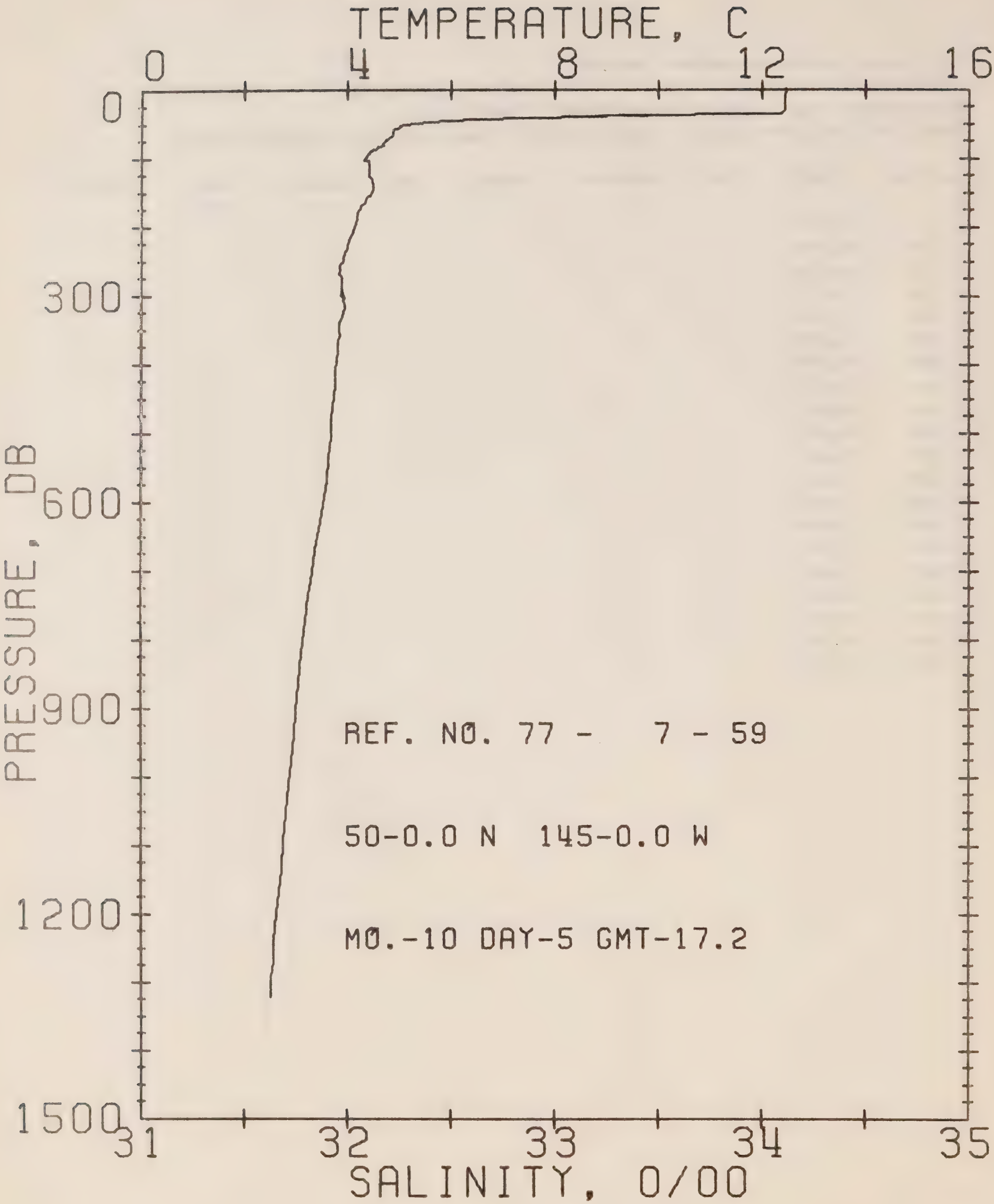
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 51 DATE 3/10/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 124 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.46							
10	12.46							
20	12.46							
30	12.26							
50	5.31							
75	4.65							
100	4.45							
125	4.54							
150	4.37							
175	4.24							
200	4.08							
225	3.96							
250	3.85							
300	3.81							
400	3.72							
500	3.61							
600	3.46							
800	3.12							
1000	2.81							
1200	2.56							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 53
50-0.0 N 145-0.0 W
MO.-10 DAY-4 GMT-17.2
31
32
33
34
35
SALINITY, 0/00

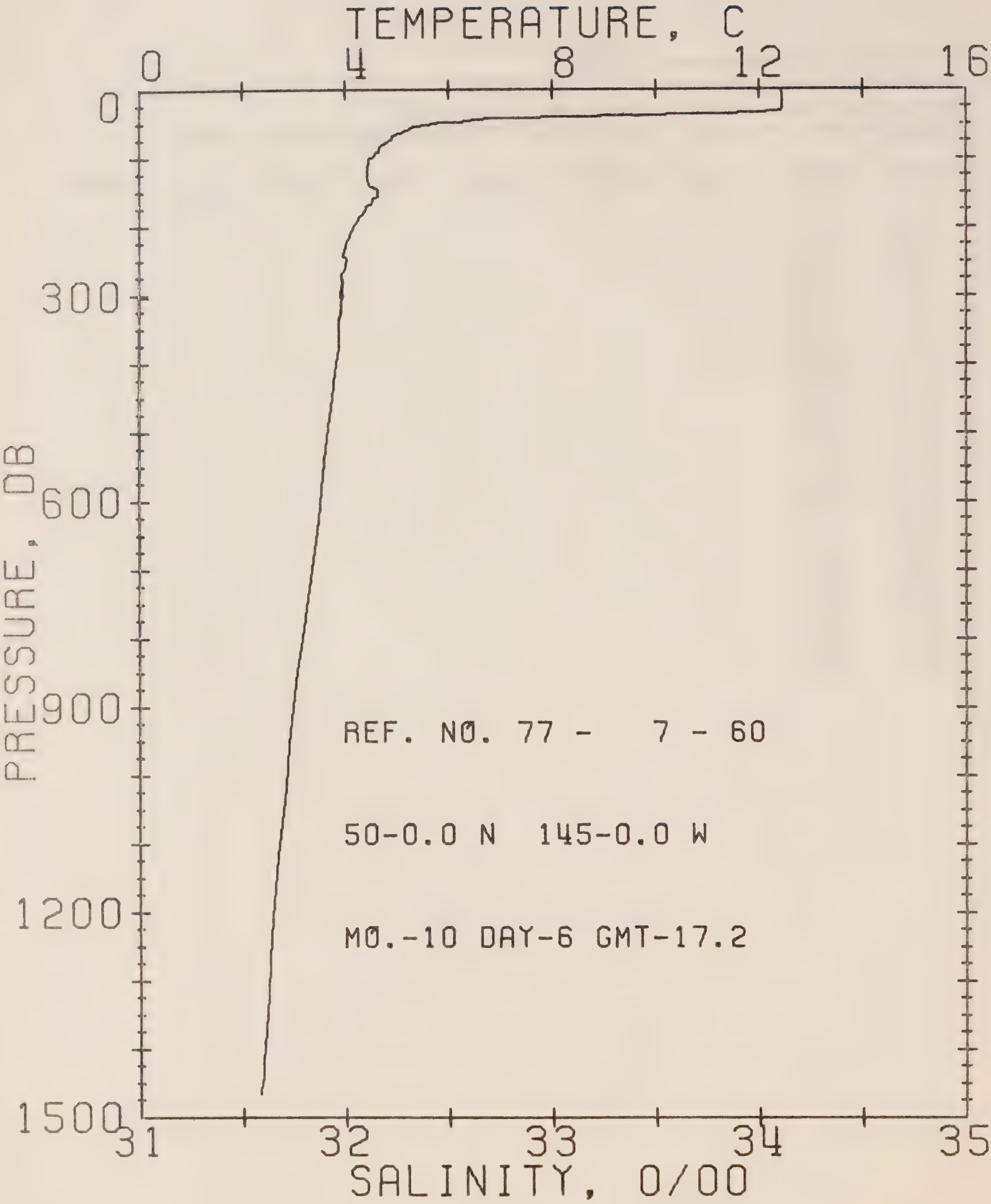
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 53 DATE 4/10/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 135 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.43							
10	12.43							
20	12.43							
30	11.71							
50	5.58							
75	4.84							
100	4.49							
125	4.39							
150	4.47							
175	4.25							
200	4.14							
225	4.06							
250	3.98							
300	3.93							
400	3.74							
500	3.62							
600	3.47							
800	3.10							
1000	2.82							
1200	2.58							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NØ. 77 - 7 - 59
50-0.0 N 145-0.0 W
MØ.-10 DAY-5 GMT-17.2
31
32
33
34
35
SALINITY, 0/00

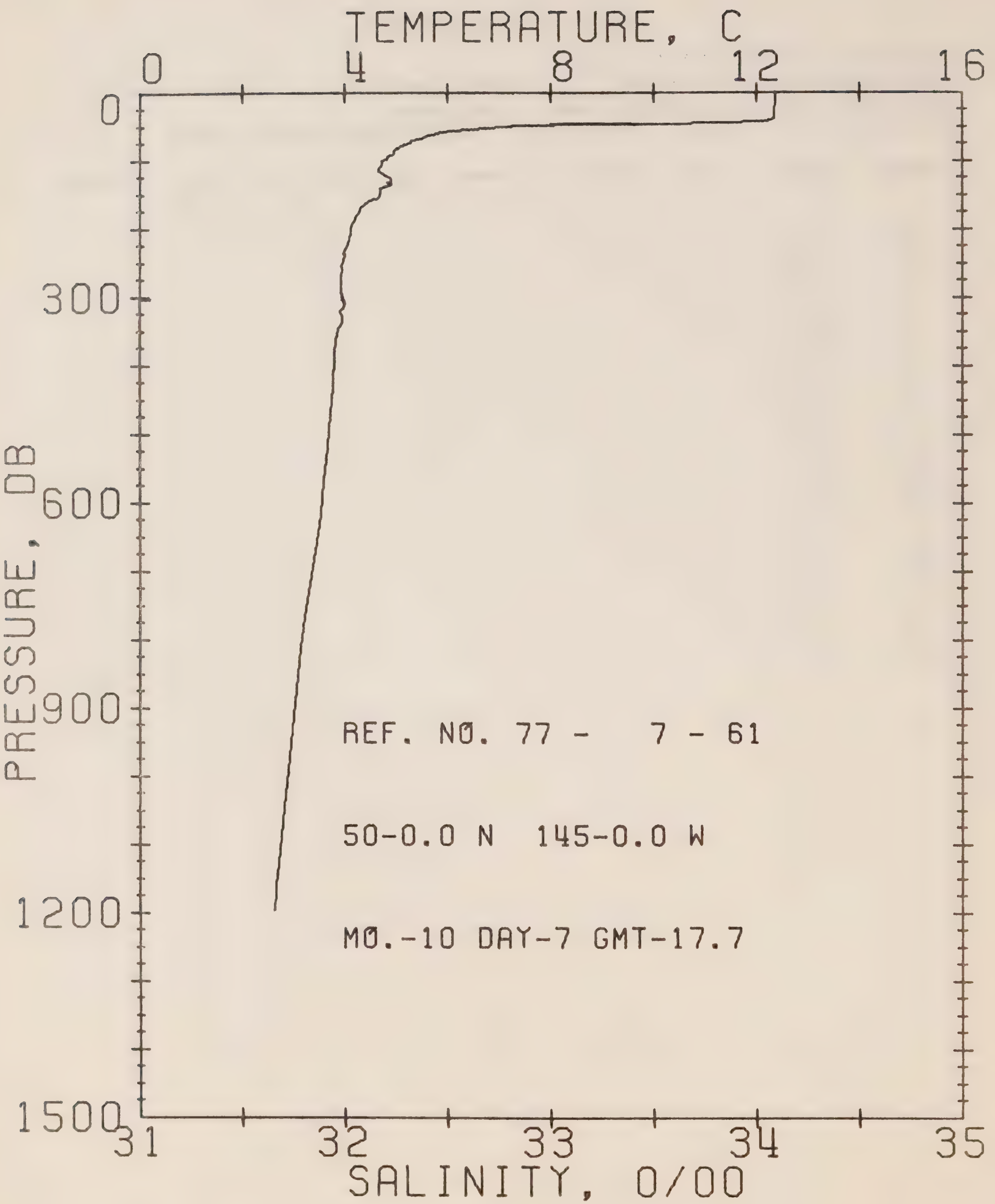
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 59 DATE 5/10/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 153 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.47							
10	12.46							
20	12.46							
30	12.45							
50	5.41							
75	4.74							
100	4.34							
125	4.43							
150	4.48							
175	4.22							
200	4.13							
225	4.01							
250	3.91							
300	3.90							
400	3.75							
500	3.63							
600	3.48							
800	3.09							
1000	2.82							
1200	2.57							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 60
50-0.0 N 145-0.0 W
MO.-10 DAY-6 GMT-17.2
31
32
33
34
35
SALINITY, 0/00

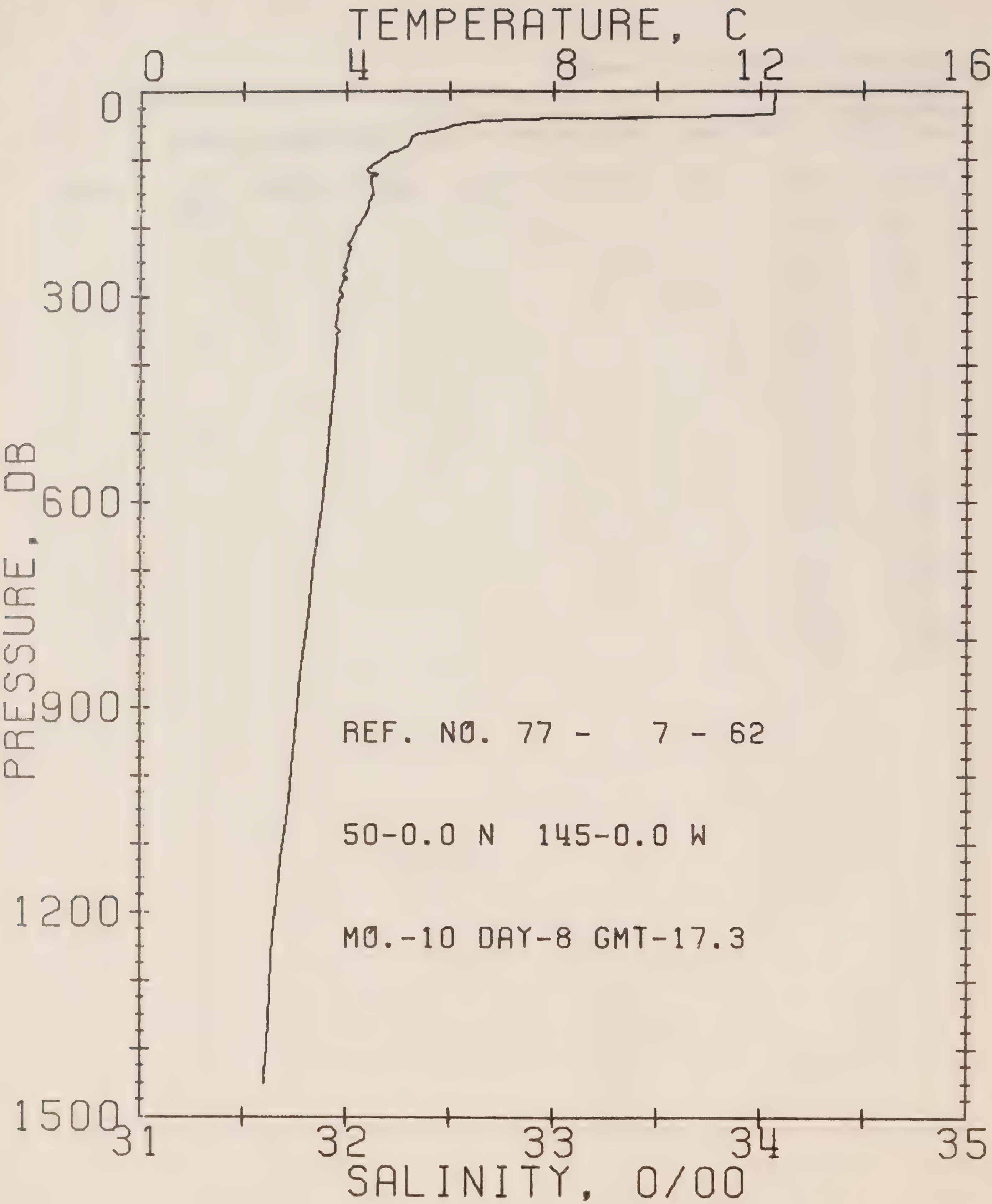
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 60 DATE 6/10/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 144 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.43							
10	12.44							
20	12.44							
30	12.43							
50	5.77							
75	4.84							
100	4.51							
125	4.42							
150	4.63							
175	4.39							
200	4.16							
225	4.01							
250	4.02							
300	3.91							
400	3.78							
500	3.61							
600	3.46							
800	3.10							
1000	2.79							
1200	2.52							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NØ. 77 - 7 - 61
50-0.0 N 145-0.0 W
MØ.-10 DAY-7 GMT-17.7
31
32
33
34
35
SALINITY, 0/00

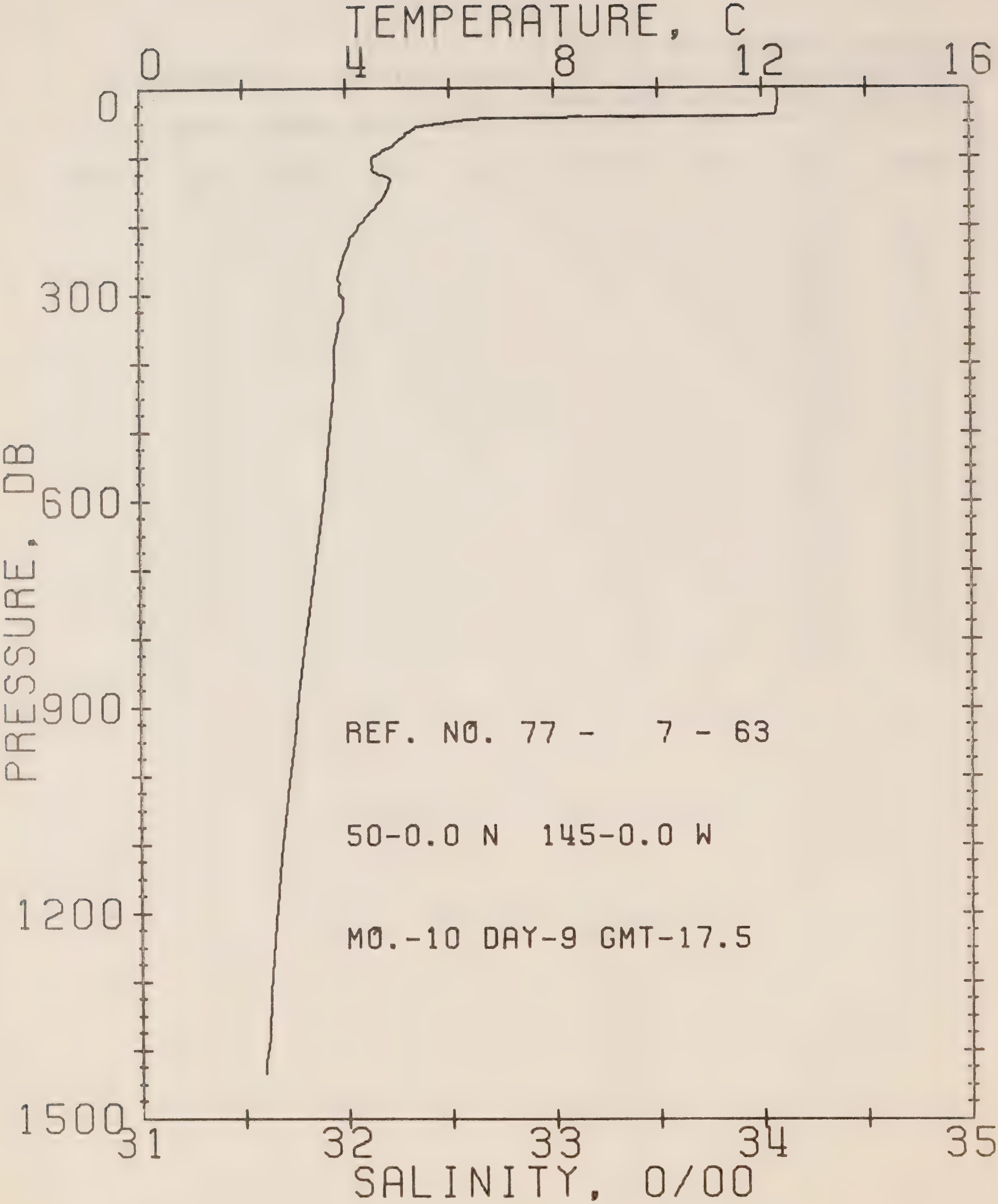
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 61 DATE 7/10/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.7
RESULTS OF STP CAST 130 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.36							
10	12.36							
20	12.35							
30	12.35							
50	7.20							
75	5.22							
100	4.76							
125	4.90							
150	4.68							
175	4.27							
200	4.11							
225	4.03							
250	3.95							
300	3.95							
400	3.75							
500	3.64							
600	3.49							
800	3.11							
1000	2.82							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NØ. 77 - 7 - 62
50-0.0 N 145-0.0 W
MØ.-10 DAY-8 GMT-17.3
31
32
33
34
35
SALINITY, 0/00

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 62 DATE 8/10/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 143 POINTS TAKEN FROM ANALOG TRACE

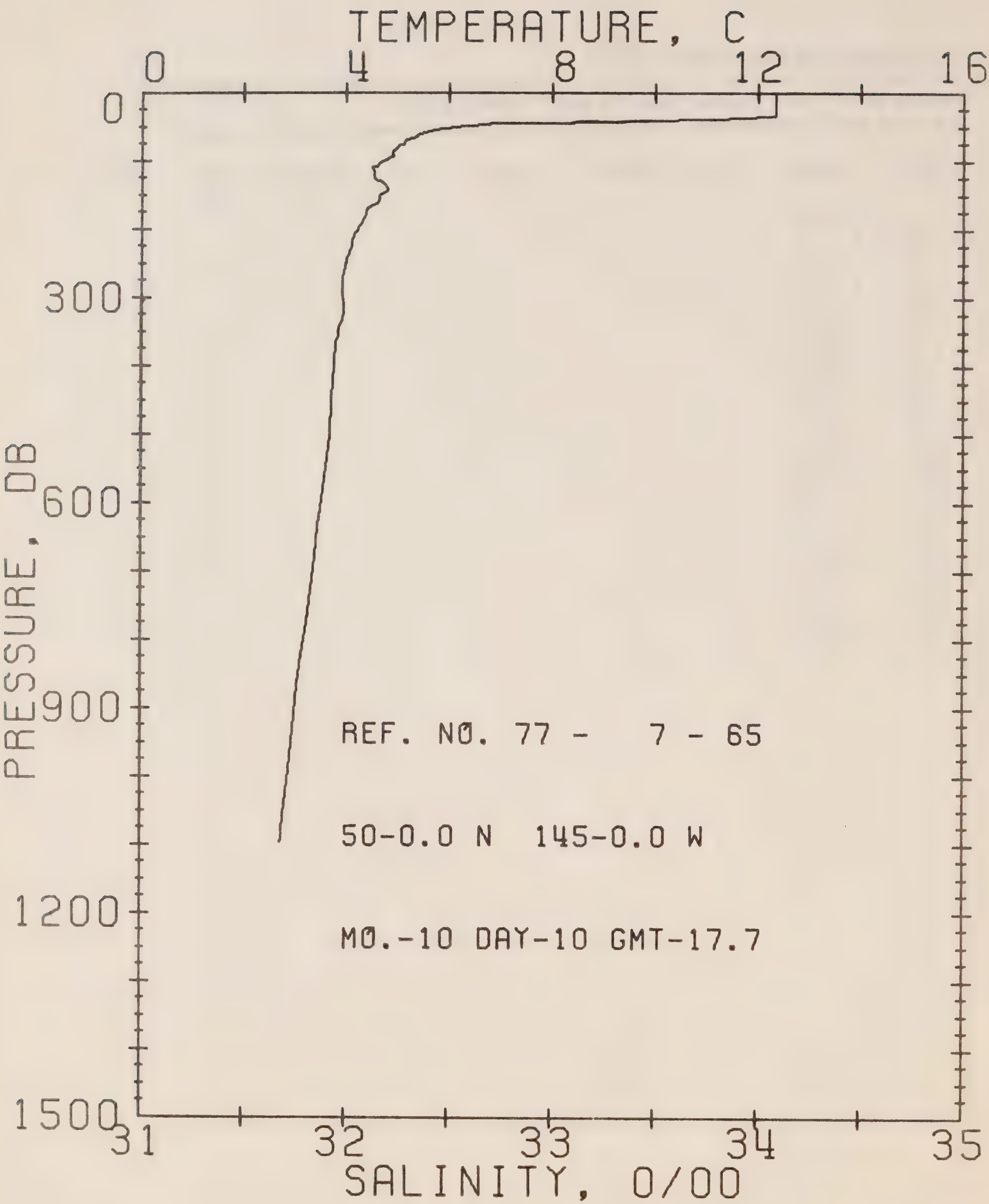
PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.28							
10	12.28							
20	12.27							
30	12.26							
50	6.15							
75	5.21							
100	4.69							
125	4.45							
150	4.51							
175	4.39							
200	4.20							
225	4.05							
250	3.99							
300	3.93							
400	3.75							
500	3.62							
600	3.49							
800	3.15							
1000	2.86							
1200	2.57							



TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 63
50-0.0 N 145-0.0 W
MO.-10 DAY-9 GMT-17.5
31
32
33
34
35
SALINITY, 0/00

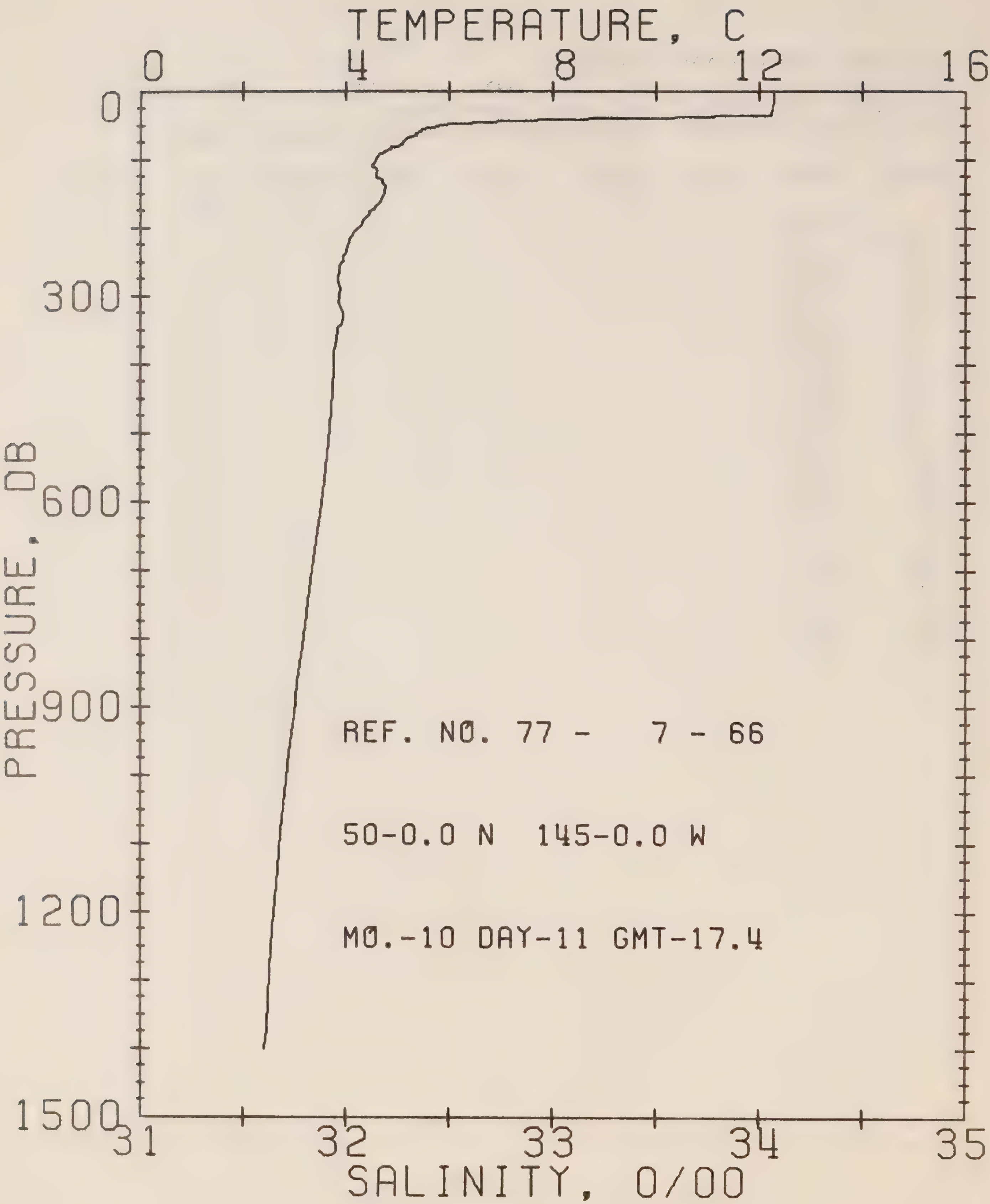
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 63 DATE 9/10/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.5
RESULTS OF STP CAST 128 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.29							
10	12.31							
20	12.31							
30	12.30							
50	6.00							
75	5.05							
100	4.54							
125	4.64							
150	4.77							
175	4.56							
200	4.24							
225	4.06							
250	3.93							
300	3.85							
400	3.73							
500	3.63							
600	3.50							
800	3.13							
1000	2.81							
1200	2.56							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NØ. 77 - 7 - 65
50-0.0 N 145-0.0 W
MØ.-10 DAY-10 GMT-17.7
31
32
33
34
35
SALINITY, 0/00

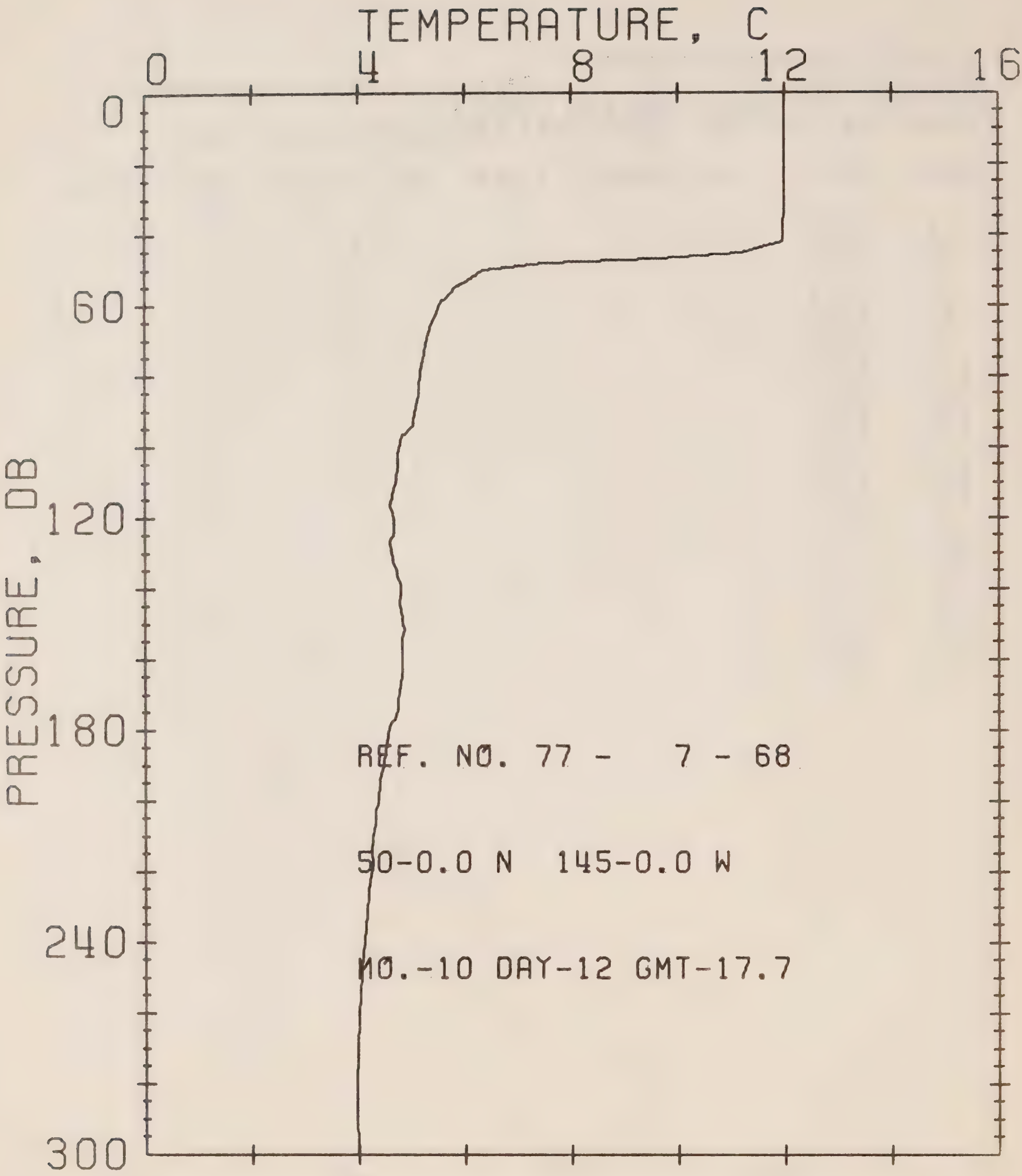
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 65 DATE 10/10/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.7
RESULTS OF STP CAST 132 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.34							
10	12.34							
20	12.34							
30	12.34							
50	6.13							
75	5.09							
100	4.73							
125	4.57							
150	4.65							
175	4.37							
200	4.20							
225	4.09							
250	3.98							
300	3.90							
400	3.74							
500	3.63							
600	3.46							
800	3.13							
1000	2.81							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 66
50-0.0 N 145-0.0 W
MO.-10 DAY-11 GMT-17.4
31
32
33
34
35
SALINITY, 0/00

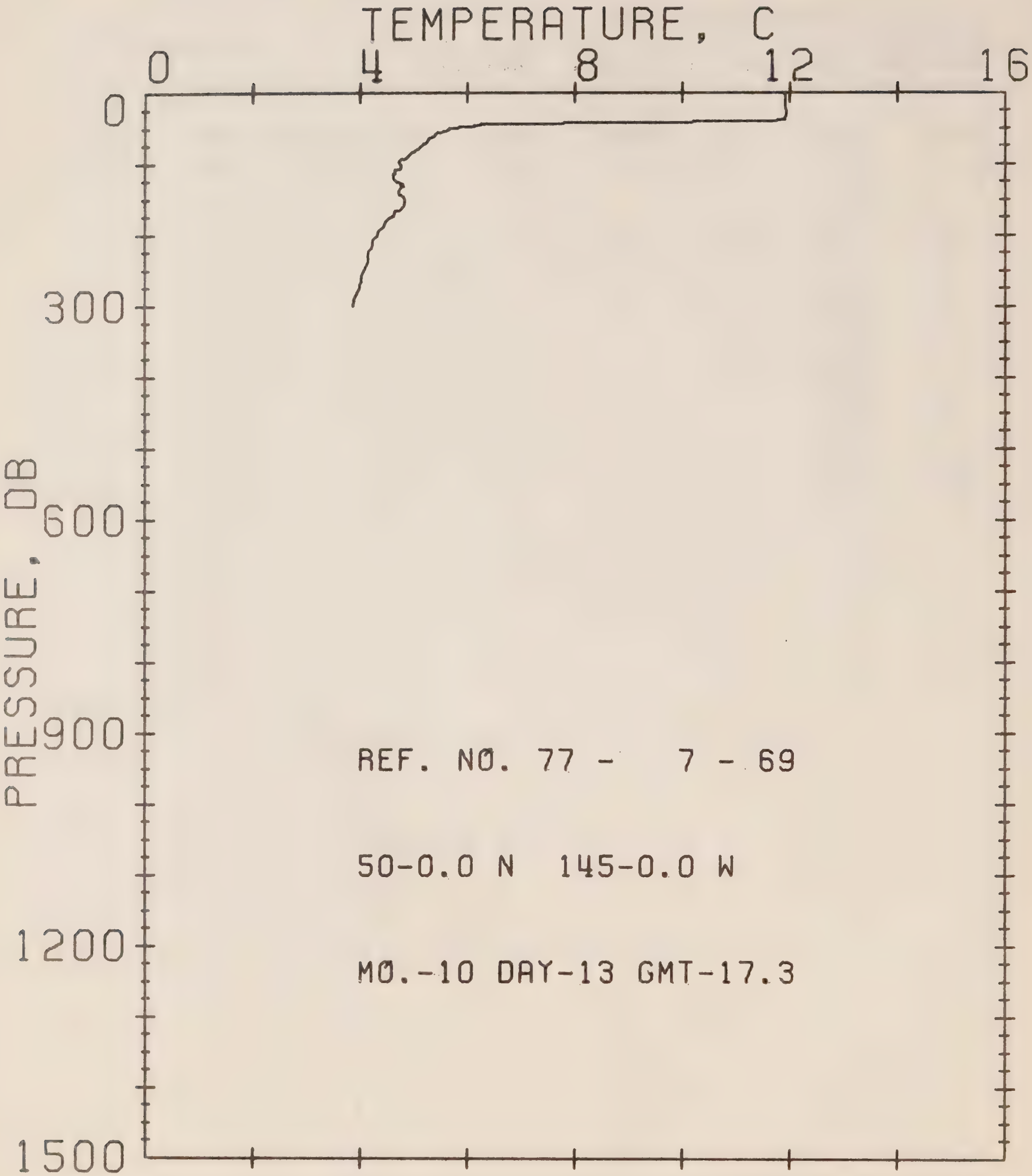
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 66 DATE 11/10/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.4
RESULTS OF STP CAST 134 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	12.28							
10	12.28							
20	12.27							
30	12.25							
50	5.98							
75	5.09							
100	4.58							
125	4.60							
150	4.73							
175	4.51							
200	4.24							
225	4.02							
250	3.94							
300	3.86							
400	3.74							
500	3.63							
600	3.47							
800	3.12							
1000	2.79							
1200	2.54							


TEMPERATURE, C
0
4
8
12
16
PRESSURE, DB
0
60
120
180
240
300
REF. NO. 77 - 7 - 68
50-0.0 N 145-0.0 W
MO.-10 DAY-12 GMT-17.7

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 68 DATE 12/10/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.7
RESULTS OF STP CAST 105 POINTS TAKEN FROM ANALOG TRACE

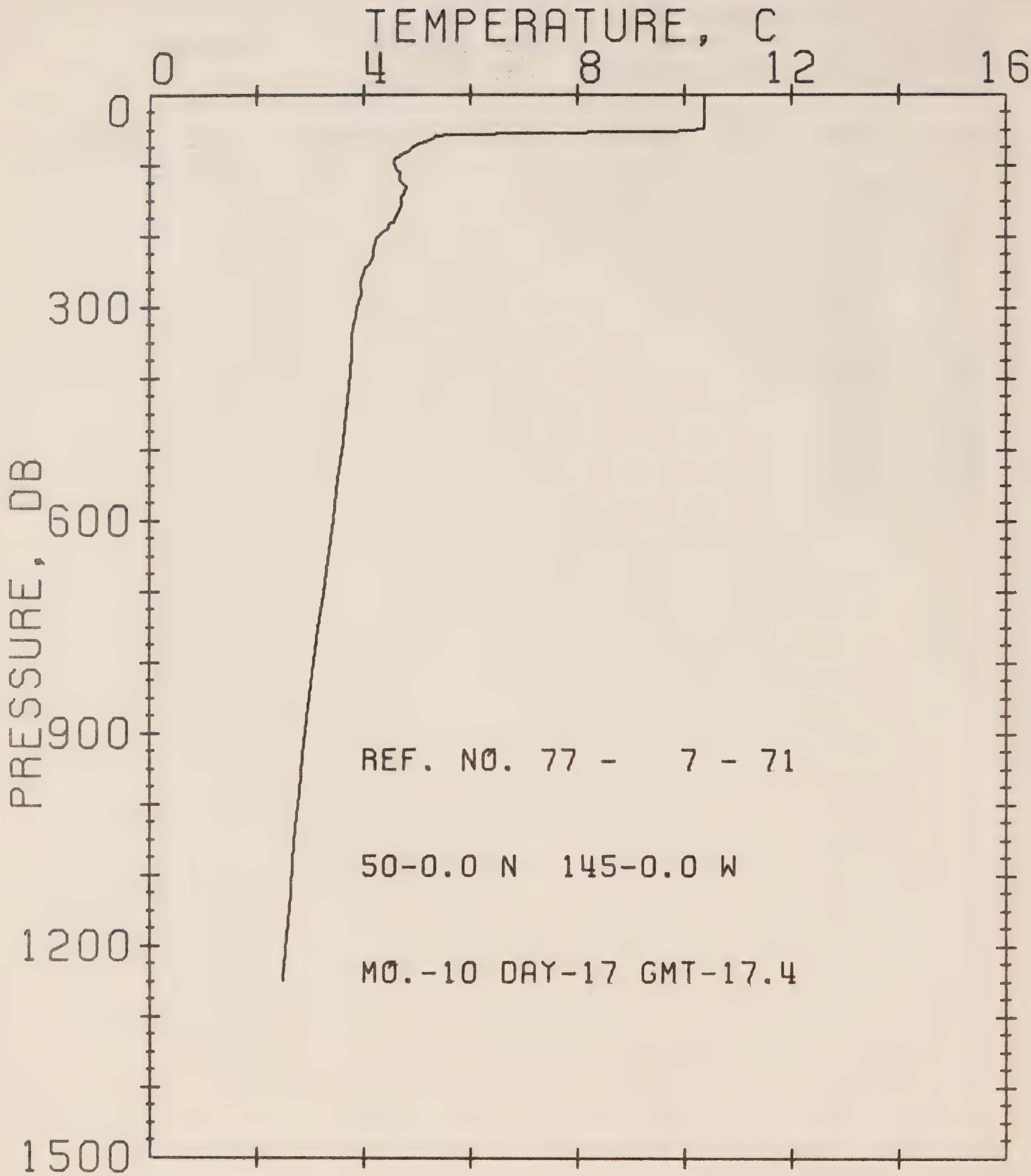
PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.99							
10	11.99							
20	11.99							
30	11.99							
50	6.34							
75	5.23							
100	4.79							
125	4.66							
150	4.84							
175	4.73							
200	4.37							
225	4.20							
250	4.05							
300	3.97							



TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NØ. 77 - 7 - 69
50-0.0 N 145-0.0 W
MØ.-10 DAY-13 GMT-17.3

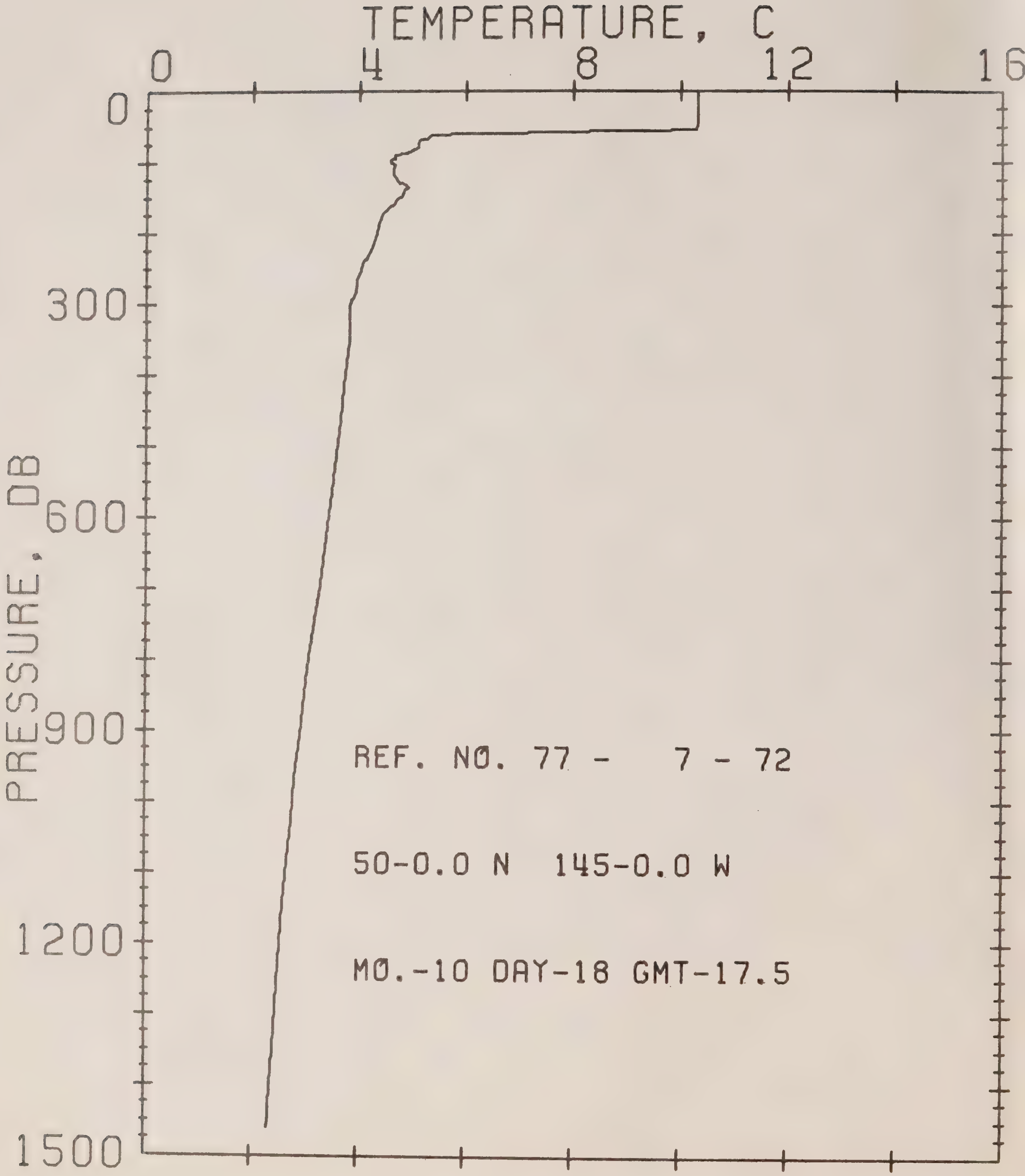
OFFSHORE OCEANOGPAPHY GROUP
REFERENCE NO. 77- 7- 69 DATE 13/10/77 STATION P
POSITION 50- 0.0N. 145- 0.0W GMT 17.3
RESULTS OF STP CAST 100 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	11.84							
10	11.93							
20	11.93							
30	11.94							
50	5.84							
75	5.16							
100	4.72							
125	4.67							
150	4.82							
175	4.59							
200	4.33							
225	4.18							
250	4.09							
300	3.88							


TEMPERATURE, C
0
4
8
12
16
PRESSURE, DB
0
300
600
900
1200
1500
REF. NØ. 77 - 7 - 71
50-0.0 N 145-0.0 W
MØ.-10 DAY-17 GMT-17.4

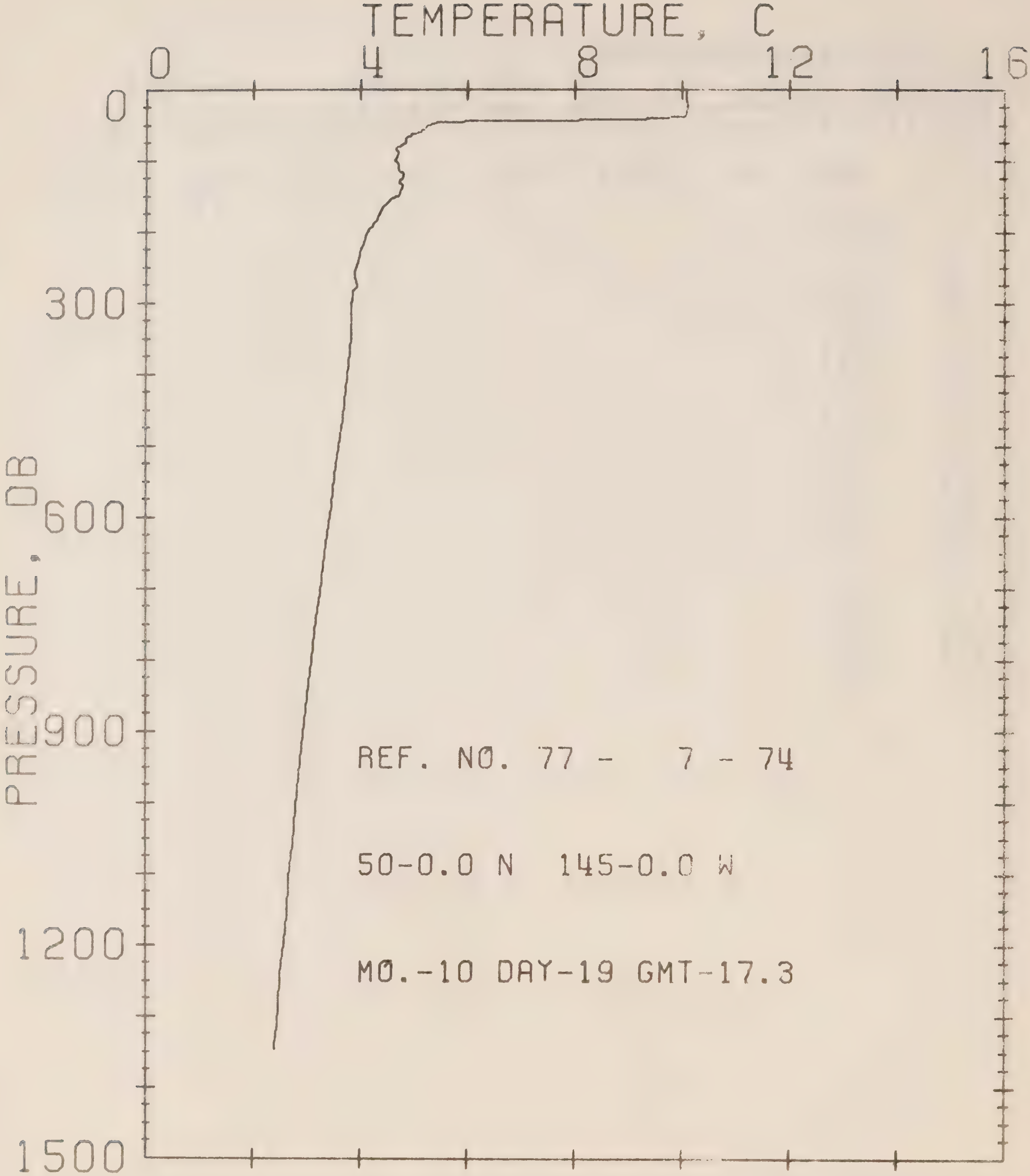
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 71 DATE 17/10/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.4
RESULTS OF STP CAST 129 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	10.37							
10	10.37							
20	10.37							
30	10.38							
50	10.21							
75	4.92							
100	4.57							
125	4.72							
150	4.71							
175	4.60							
200	4.30							
225	4.19							
250	4.03							
300	3.88							
400	3.75							
500	3.60							
600	3.43							
800	3.08							
1000	2.77							
1200	2.55							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NØ. 77 - 7 - 72
50-0.0 N 145-0.0 W
MØ.-10 DAY-18 GMT-17.5

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 72 DATE 18/10/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.5
RESULTS OF STP CAST 125 POINTS TAKEN FROM ANALOG TRACE

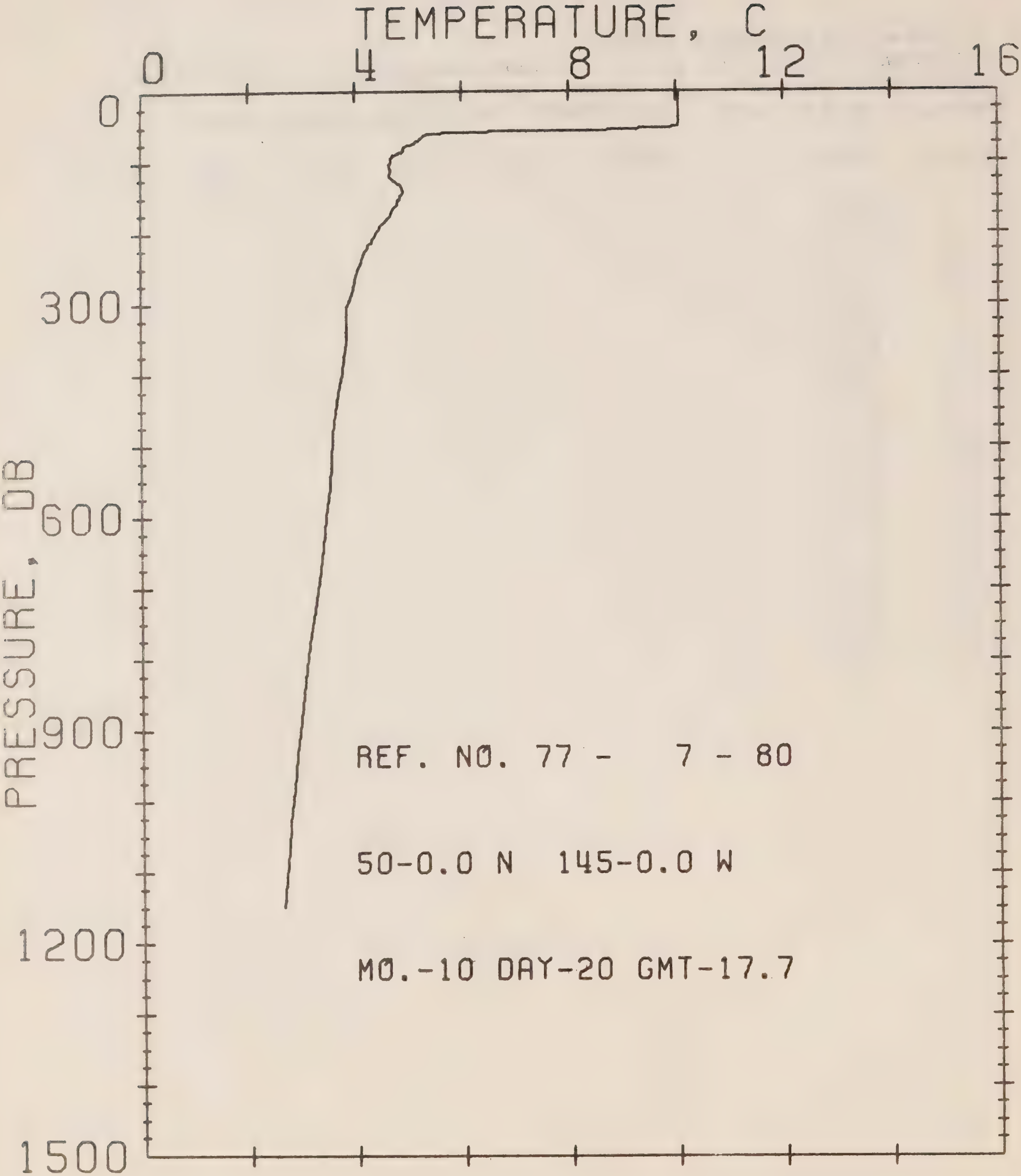
PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	10.32							
10	10.32							
20	10.32							
30	10.32							
50	10.32							
75	5.11							
100	4.57							
125	4.69							
150	4.79							
175	4.44							
200	4.35							
225	4.24							
250	4.07							
300	3.86							
400	3.76							
500	3.61							
600	3.46							
800	3.10							
1000	2.80							
1200	2.56							



TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NØ. 77 - 7 - 74
50-0.0 N 145-0.0 W
MØ.-10 DAY-19 GMT-17.3

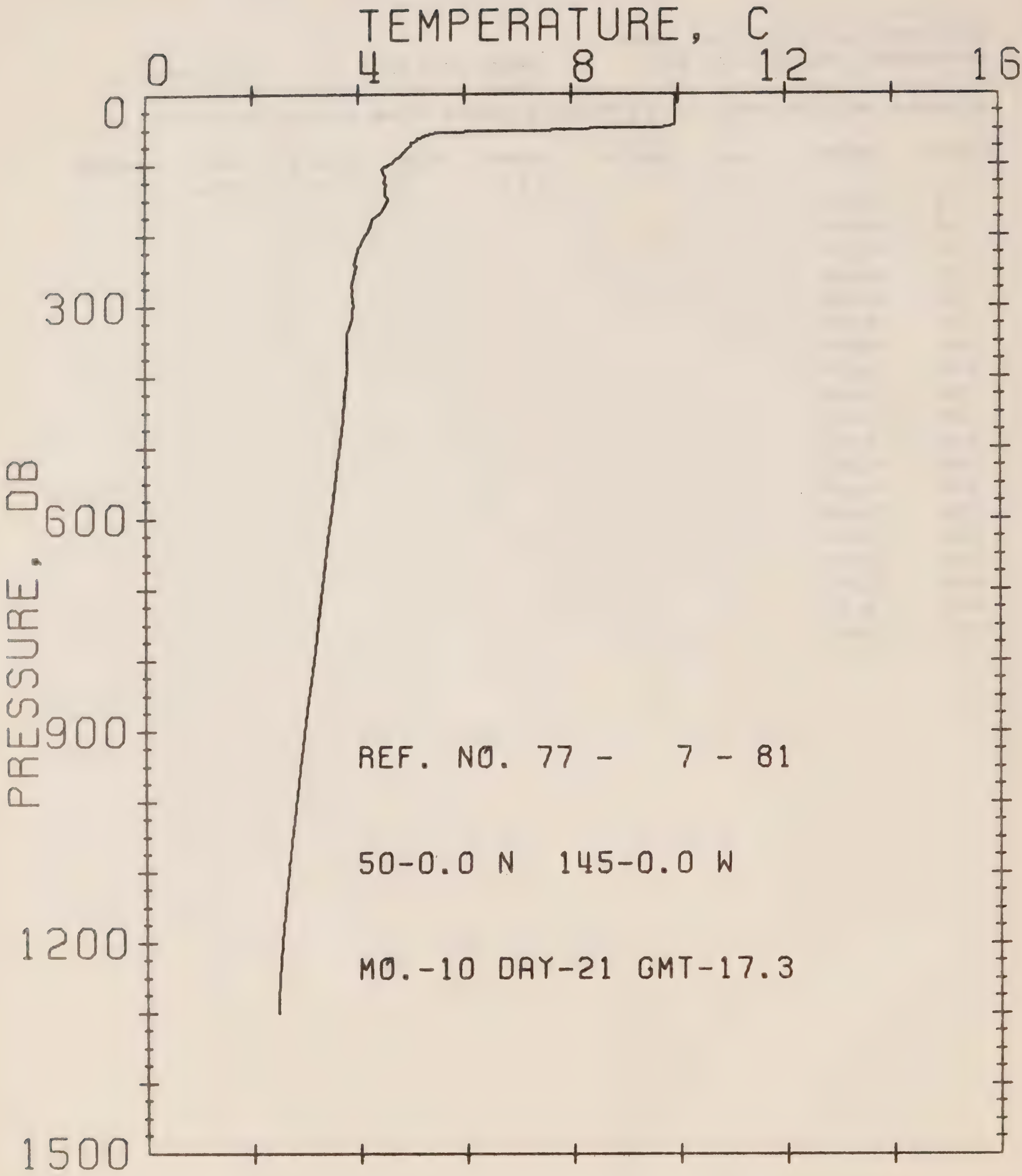
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 74 DATE 19/10/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 131 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	10.09							
10	10.09							
20	10.10							
30	10.10							
50	5.29							
75	4.85							
100	4.66							
125	4.80							
150	4.68							
175	4.38							
200	4.15							
225	4.02							
250	3.95							
300	3.85							
400	3.76							
500	3.60							
600	3.44							
800	3.09							
1000	2.81							
1200	2.58							


TEMPERATURE, C
0
4
8
12
16
PRESSURE, DB
0
300
600
900
1200
1500
REF. NO. 77 - 7 - 80
50-0.0 N 145-0.0 W
MO.-10 DAY-20 GMT-17.7

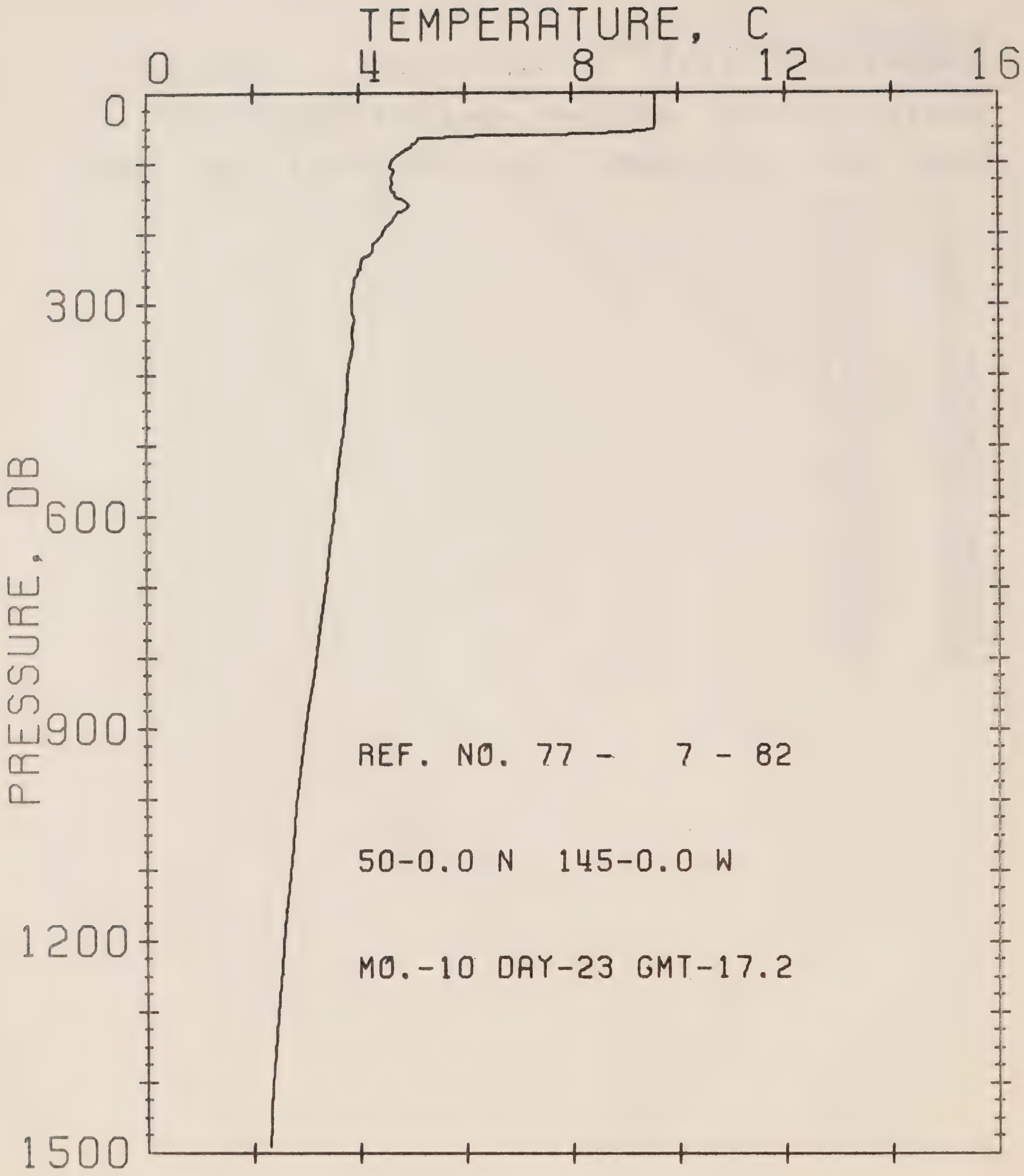
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 80 DATE 20/10/77 STATION P
POSITION 50- 0.0N. 145- 0.0W GMT 17.7
RESULTS OF STP CAST 123 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	10.05							
10	10.05							
20	10.05							
30	10.06							
50	10.05							
75	5.06							
100	4.68							
125	4.70							
150	4.85							
175	4.67							
200	4.41							
225	4.21							
250	4.09							
300	3.88							
400	3.76							
500	3.57							
600	3.45							
800	3.10							
1000	2.80							


TEMPERATURE, C
0
4
8
12
16
PRESSURE, DB
0
300
600
900
1200
1500
REF. NO. 77 - 7 - 81
50-0.0 N 145-0.0 W
MO.-10 DAY-21 GMT-17.3

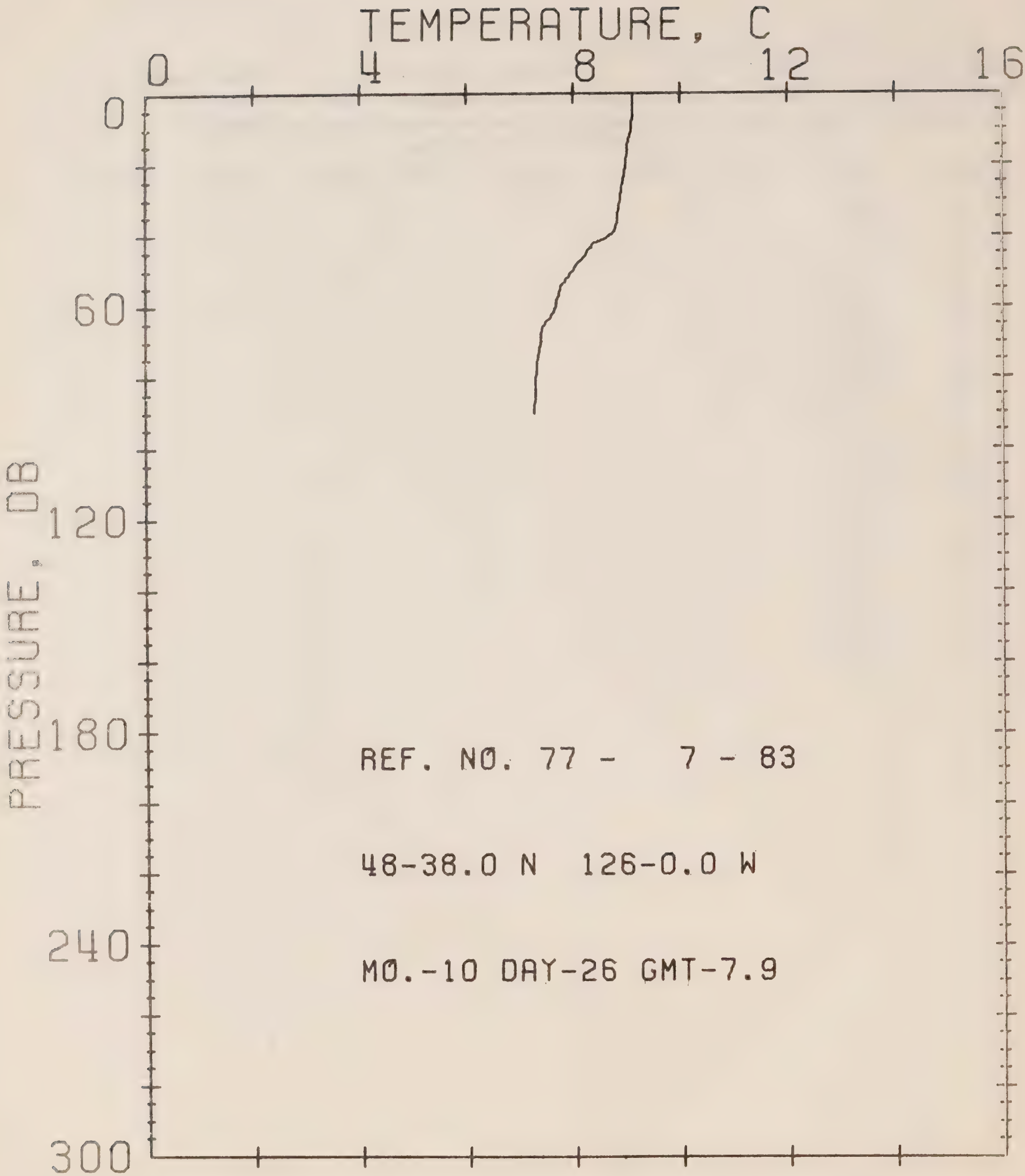
OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 81 DATE 21/10/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.3
RESULTS OF STP CAST 122 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	9.96							
10	9.96							
20	9.96							
30	9.96							
50	7.94							
75	4.99							
100	4.56							
125	4.49							
150	4.58							
175	4.33							
200	4.15							
225	3.98							
250	3.96							
300	3.91							
400	3.77							
500	3.64							
600	3.47							
800	3.15							
1000	2.81							
1200	2.54							


TEMPERATURE, C
0
4
8
12
16
0
300
600
900
1200
1500
PRESSURE, DB
REF. NO. 77 - 7 - 82
50-0.0 N 145-0.0 W
MO.-10 DAY-23 GMT-17.2

UFFSHORE OCEANUGRAPHY GROUP
REFERENCE NO. 77- 7- 82 DATE 23/10/77 STATION P
POSITION 50- 0.0N, 145- 0.0W GMT 17.2
RESULTS OF STP CAST 124 POINTS TAKEN FROM ANALOG TRACE

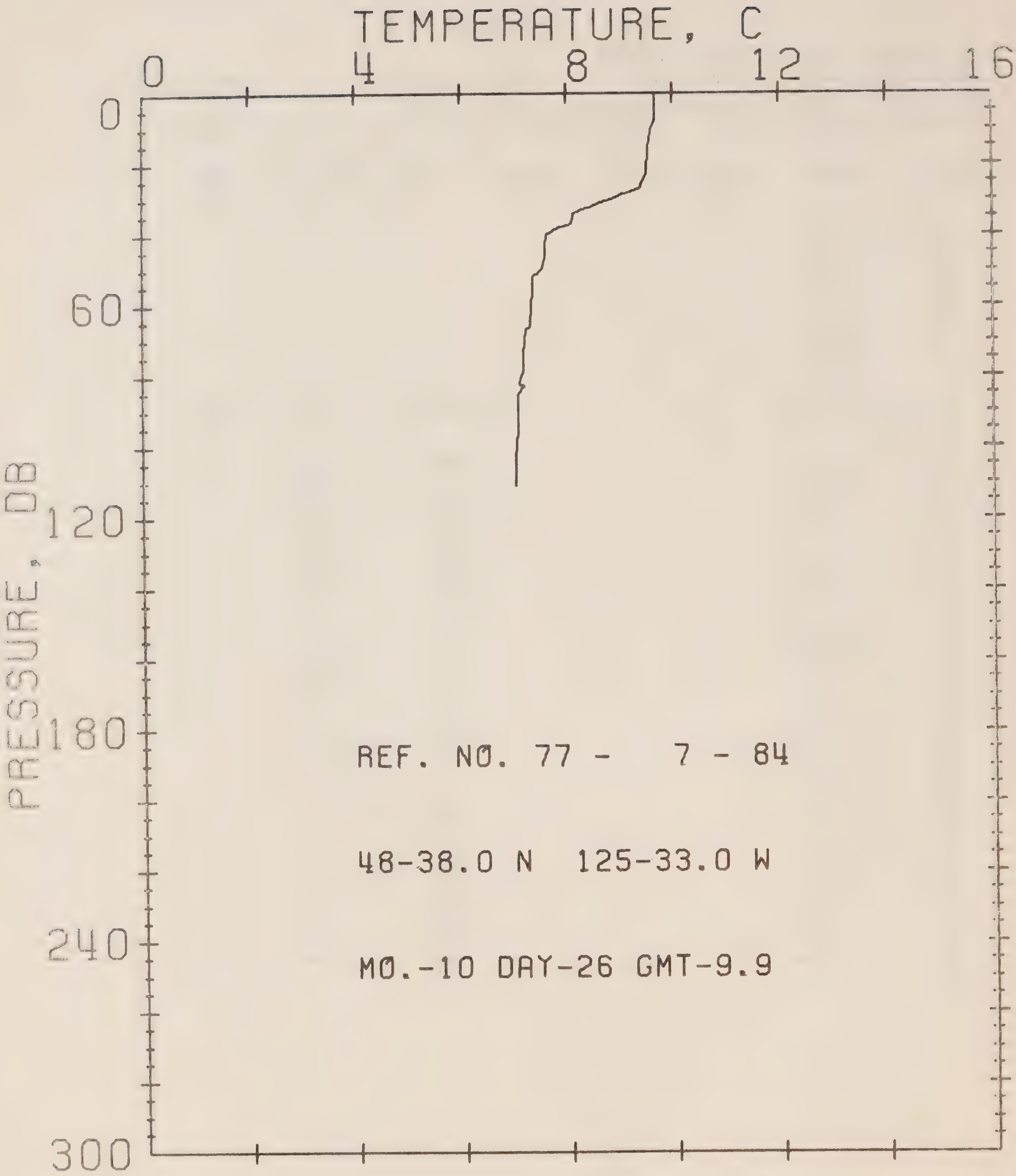
PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	9.57							
10	9.58							
20	9.58							
30	9.58							
50	9.56							
75	5.01							
100	4.63							
125	4.62							
150	4.77							
175	4.69							
200	4.45							
225	4.26							
250	4.04							
300	3.86							
400	3.80							
500	3.67							
600	3.53							
800	3.18							
1000	2.83							
1200	2.58							


TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 77 - 7 - 83
48-38.0 N 126-0.0 W
MO.-10 DAY-26 GMT-7.9

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 83 DATE 26/10/77 STATION 2
POSITION 48-38.0N, 126- 0.0W GMT 7.9
RESULTS OF STP CAST 45 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	9.11							
10	9.09							
20	8.98							
30	8.89							
50	8.01							
75	7.33							

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	9.11		55.	7.77	
4.	9.11		57.	7.73	
5.	9.11		58.	7.72	
11.	9.09		59.	7.69	
15.	9.02		60.	7.67	
17.	9.00		62.	7.64	
20.	8.98		64.	7.53	
23.	8.95		66.	7.41	
27.	8.91		67.	7.41	
30.	8.89		68.	7.40	
35.	8.84		70.	7.39	
36.	8.82		73.	7.35	
38.	8.79		74.	7.33	
39.	8.78		77.	7.32	
40.	8.66		79.	7.31	
41.	8.61		81.	7.29	
42.	8.40		83.	7.28	
44.	8.29		86.	7.27	
46.	8.21		87.	7.27	
48.	8.09		88.	7.26	
49.	8.06		89.	7.26	
52.	7.90		90.	7.26	
54.	7.78				



TEMPERATURE, C
0
4
8
12
16
0
60
120
180
240
300
PRESSURE, DB
REF. NO. 77 - 7 - 84
48-38.0 N 125-33.0 W
MO.-10 DAY-26 GMT-9.9

OFFSHORE OCEANOGRAPHY GROUP
REFERENCE NO. 77- 7- 84 DATE 26/10/77 STATION 1
POSITION 48-38.0N, 125-33.0W GMT 9.9
RESULTS OF STP CAST 56 POINTS TAKEN FROM ANALOG TRACE

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	9.68							
10	9.63							
20	9.53							
30	8.88							
50	7.51							
75	7.17							
100	7.05							

DEPTH	TEMP	SAL	DEPTH	TEMP	SAL
0.	9.68		46.	7.59	
3.	9.68		49.	7.57	
4.	9.68		50.	7.51	
6.	9.68		52.	7.37	
8.	9.67		56.	7.35	
11.	9.61		61.	7.33	
12.	9.60		62.	7.33	
13.	9.56		64.	7.32	
17.	9.55		66.	7.31	
18.	9.54		67.	7.22	
21.	9.53		71.	7.19	
23.	9.52		74.	7.17	
24.	9.50		75.	7.17	
26.	9.42		79.	7.16	
27.	9.40		82.	7.10	
28.	9.19		83.	7.19	
29.	9.02		85.	7.07	
30.	8.88		88.	7.07	
31.	8.65		94.	7.06	
32.	8.50		96.	7.06	
33.	8.28		99.	7.05	
34.	8.14		101.	7.05	
35.	8.13		102.	7.02	
37.	8.10		104.	7.02	
38.	7.84		106.	7.01	
40.	7.63		107.	7.01	
44.	7.61		109.	7.02	
45.	7.60		111.	7.02	

Surface Salinity and Temperature Observations

(P-77-7)

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 77- 7

DATE/TIME				SALINITY	TEMP	LONGITUDE
YR	MO	DY	GMT	0/00	C	WEST
77	9	9	1809	30.297		123-30
77	9	9	1942	31.333		124- 0
77	9	9	2105	31.279[b]		124-30
77	9	9	2230	31.656		125- 0
77	9	9	2355	32.078	14.2	125-33
77	9	10	150	31.987	13.9	126- 0
77	9	10	410	32.104	15.7	126-40
77	9	10	749	32.110[b]	15.4	127-40
77	9	10	1034	32.165[b]	15.4	128-40
77	9	10	1255	32.436[b]	15.7	129-40
77	9	10	1549	32.476	15.4	130-40
77	9	10	1908	32.172	15.3	131-40
77	9	10	2200	32.282	15.4	132-40
77	9	11	334	32.242	15.3	133-40
77	9	11	650	32.245	15.3	134-40
77	9	11	931	32.520	15.4	135-40
77	9	11	1247		14.8	136-40
77	9	11	1608	32.486	14.4	137-40
77	9	11	1916	32.489	14.2	138-40
77	9	11	2123	32.546	14.1	139-40
77	9	12	47	32.526	14.1	140-40
77	9	12	540	32.603	14.1	141-40
77	9	12	1000	32.603	14.0	142-40
77	9	12	1438	32.641	13.5	143-40
77	9	13	0	32.562	14.2	ON STATION
77	9	15	0	32.598	13.9	ON STATION
77	9	16	0	32.597	13.5	ON STATION
77	9	17	0	32.594	13.3	ON STATION
77	9	18	0	32.586	13.0	ON STATION
77	9	19	0	32.590	13.0	ON STATION
77	9	20	0	32.608	13.0	ON STATION
77	9	22	0	32.591	13.0	ON STATION
77	9	23	0	32.596	13.0	ON STATION
77	9	24	0	32.608	12.7	ON STATION
77	9	25	0	32.608	12.7	ON STATION
77	9	26	0	32.608	12.8	ON STATION
77	9	27	0	32.614	12.7	ON STATION
77	9	29	0	32.613	12.6	ON STATION
77	9	30	0	32.616	12.5	ON STATION
77	10	1	0	32.620	12.5	ON STATION
77	10	2	0	32.619	12.5	ON STATION
77	10	3	0	32.614	12.5	ON STATION
77	10	4	0	32.613	12.5	ON STATION
77	10	6	0	32.617	12.5	ON STATION

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 77- 7

DATE/TIME				SALINITY	TEMP	LONGITUDE
YR	MO	DY	GMT	0/00	C	WEST
77	10	7	0	32.624	12.5	ON STATION
77	10	8	0	32.638	12.3	ON STATION
77	10	9	0	32.627	12.3	ON STATION
77	10	10	0	32.627	12.3	ON STATION
77	10	11	0	32.632	12.4	ON STATION
77	10	13	0	32.630	12.0	ON STATION
77	10	14	0	32.624 b	11.8	ON STATION
77	10	15	0	32.668 b	11.5	ON STATION
77	10	16	0	32.650	11.0	ON STATION
77	10	17	0	32.703 b	10.5	ON STATION
77	10	18	0	32.688	10.4	ON STATION
77	10	19	0	32.681	10.2	ON STATION
77	10	21	0	32.679	10.0	ON STATION
77	10	22	0	32.672	9.8	ON STATION
77	10	23	0	32.689 b	9.8	ON STATION
77	10	23	2324	32.660 b	10.4	143-40
77	10	24	1136	32.608 b	10.9	140-40
77	10	25	1855	32.195 b	11.9	130-40
77	10	25	2125	32.293 b	11.6	129-40
77	10	26	30	32.399 b	12.3	128-40
77	10	26	300	32.152 b	11.4	127-40
77	10	26	540	32.203 b	12.9	126-40
77	10	26	745	32.319	9.0	126- 0
77	10	26	950	32.002	9.6	125-33
77	10	26	1215	32.059		125- 0
77	10	26	1420	31.616		124-30
77	10	26	1725	31.940		124- 0
77	10	26	1910	31.561		123-30

b DENOTES SALINITY SAMPLE TAKEN FROM A BUCKET. ALL OTHER SAMPLES TAKEN FROM THE SEAWATER LOOP

List of Omissions from Data

Hydrographic Data:

					Notes			
Consec. #	Depth (m)	Temp.	Sal.	O_2	1.	2.	3.	Comments
13	2503	*						Mistrip
	3501		*			*		
	3995		*			*		
26	990		*					No sample
	990			*		*		
	2969		*			*		
	4153		*			*		
	4153			*	*			
	4163		*		*			
39	593			*		*		
	2499		*			*		
	2499			*		*		
	4096		*			*		
	4096			*		*		
52	597		*			*		
	2492		*					No sample
	4189		*			*		Mistrip
	4189			*		*		
64	4037		*					No sample
	4037			*				No sample
	4047		*			*		
	4047			*	*			
73	487	*						Mistrip
	4018		*			*		
	4018			*		*		
	4107		*		*			
	4107			*		*		
	4116		*			*		
	4116			*		*		

Notes (MacNeill, 1977):

1. The data is suspect because of a reversal of gradient by >.01 $^{o}/oo$ (salinity) or >.08 ml/ℓ (oxygen).

2. The data is deleted because of very irregular data values (usually a mistripping or leaking bottle if both oxygen and salinity are irregular).

3. The data is deleted because duplicate samples at a depth were not within .01 $^{o}/oo$ (salinity) or .08 ml/ℓ (oxygen).

STP Data:

Consecutive Number	Comments
1 to 5, 7 to 10	omitted; traces erratic
11, 12, 14, 36 to 38, 40, 46, 48 to 66, 68 to 84	salinity trace omitted; inconsistent data due to a malfunction in the salinity sensor

Note: Consecutive numbers 15 to 19, 28 to 32, 41 to 45, 54 to 58, 67, and 75 to 79 are STP's taken as part of the MILE program. They are not included in this report.